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THE ATLAS GEOGRAPHIES

A NEW VISUAL ATLAS AND GEOGRAPHY
COMBINED

PART III. SENIOR GEOGRAPHY

*SUITABLE FOR STUDENTS IN THE UPPER FORMS OF PUBLIC AND SECONDARY
SCHOOLS, AND ADAPTED TO MEET THE REQUIREMENTS OF THE UNIVERSITY
LOCALS, CIVIL SERVICE, AND OTHER EXAMINATIONS*

No. 4—AFRICA

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GENERAL PREFACE TO SERIES.

THE authors have been induced to compile this Series owing to the difficulty they have experienced in practical teaching with the Atlas itself divorced from the Geography text-book. The method of constant reference from the one to the other entails loss of time, and often proves unsatisfactory in other ways. Difficulty has been found in separating the names necessary for the study of any particular aspect of the subject from the general confusion of names to be found in many present-day Atlases.

The writers have therefore aimed at presenting the main features of the subject on a visual method which they have used in preparing students for University and Civil Service Examinations, and which has received special commendation from His Majesty's Inspectors of Secondary Schools.

The geography of each area is based upon the Orographical Map, and the constant comparisons made between this and the Route, Climatic, Vegetation, Mineral, Manufactures, and Distribution of Population Maps cause the student to retain the visual impressions thus given, and so to realise the interdependence of each part on the whole. The loose map of each region, found in the envelope on the cover of the book, assists in creating this effect, as do also the transparent Route Maps, allowing a Surface Map to be placed underneath. The student thus sees how natural features determine the direction of routes, etc.

The subject-matter does not consist of any isolated facts, but is rather a careful leading onward from cause to effect, while the practical Exercises inserted necessitate the use of logical reasoning power.

The authors have to tender their thanks to Mr W. H. Barker, the Principal of the East Ham Technical College, and other practical teachers for many valuable hints and suggestions, and to the Meteorological Office, the Agents-General for the Colonies in London, and the Railway and Development Companies for the loan of maps and diagrams, which have proved most valuable in bringing both subject-matter and maps up to date.

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AFRICA.

CHAPTER I.

GENERAL GEOGRAPHY.

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World Position.

Africa forms a vast, southern peninsula of the Old World, and as it stretches from 37° N. to 34° S. latitude, the equator cuts through it almost midway. This great continent is connected with the land mass of Eurasia at four points. Find on the map the *Strait of Gibraltar*, the *Sicilian Strait*, the *Isthmus of Suez*, and the *Strait of Bab-el-Mandeb*. These are the four points by which Africa is hinged to Eurasia. The sea passes through three of them, while the fourth forms a dry strait—the *Isthmus of Suez*—through which has now been cut the *Suez Canal*, joining the Mediterranean and the Red Seas, thereby shortening the journey to India and the Far East by 2500 miles, and at the same time converting Africa into an island.

A study of these features will show a closer relationship between the land on either side of these straits. Fig. 1 shows that the *Sierra Nevada Mountains* stretch from the *Balearic Isles* through Southern Spain, and now terminate in the rock of *Gibraltar*. But these were once continuous with the *Er Rif Mountains* on

A—AFRICA, SEN.

the opposite side of the strait. The *Er Rif Mountains* are continued by the coastal chain to *Cape Bon*, and from thence through the island of *Sicily* to the *Apennines of Italy* and the *Alps*,

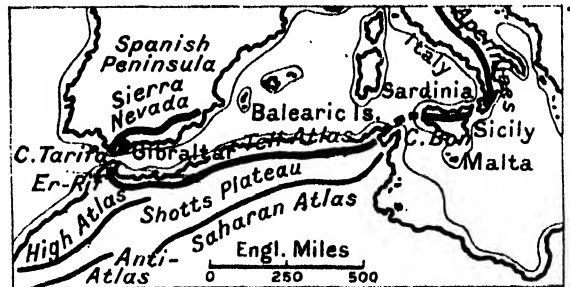




Fig. 1.—North Africa, showing connection with Europe.

thus forming a wall of mountains shutting in the Western Mediterranean. The thin line in the diagram, which marks the edge of the continental shelf, shows how very narrow are the deep-sea passages which separate Africa from Europe. To understand the close relationship between Africa and Asia, study the Surface Map of the latter. It will be seen that Arabia

 gradually slopes from the east to a steep brink overlooking the shores of the Red Sea and the Gulf of Aden. Notice that, parallel with this, on the opposite shores of the Red Sea, are similar steep brinks with gradual slopes towards the interior. These two brinks form part of a great fold which once connected Asia with Africa. Internal forces caused fractures along this upfold, and a rift valley was formed, now filled by the Red Sea.

Notice that Africa widens out considerably, north of the equator, so that, although the latter cuts it almost midway between its northern and southern extremities, the greater part of the land mass lies to the north of it. 

Seas and Coasts.

The most striking feature about the coastline of Africa is its lack of indentations. It forms a compact land mass with no long arms of the sea penetrating to the interior, as in Europe or in North America. On the north it is washed by the *Mediterranean Sea*, and along this shore the only two openings are the *Gulfs of Sidra* and *Gabes*, whose shallow quicksands, bordering the great Sahara Desert, make them valueless for commerce. On the east the *Red Sea* forms a long, narrow opening, bordered by the steep brinks of Arabia on the east and the Nubian Desert on the west. Farther south, where the coast borders the *Indian Ocean*, there are no indentations of any size, while on the west the *Atlantic* shores are similar, the *Bights of Benin* and *Biafra* being only divisions of the *Gulf of Guinea*, not sheltered in any way to form harbours.

The Mediterranean shores had in the earliest times trade communications with the opposite shores of Europe. The Moors at one period held great power in Spain, while *Carthage*, now occupied by the state of *Tunis*, was in early ages one of the ruling powers of the then known world. From the Gulf of Gabes eastward the shores border the desert, and are valueless except as an outlet for the caravan trade which crosses the Sahara from the Niger Basin. In the far east the Nile Delta forms the outlet of rich agricultural Egypt and the Sudan, *Alexandria* being the chief port. The cutting of the Suez Canal has caused the growth of *Port Said* at its Mediterranean entrance.

The *Red Sea* forms two branches at its northern end, the *Gulf of Akaba* forming the political boundary between Asia and Africa, and the *Gulf of Suez*, which is now linked to the Mediterranean by 27 miles of canal across the isthmus of the same name. In the south this sea narrows to the *Strait of Bab-el-Mandeb*, which forms a gateway to the *Gulf of Aden*. The Red Sea, owing to the opening of the Suez Canal, now forms an important passage connecting the Mediterranean Sea to the Indian Ocean, and many steamers pass through it on their way to India and the Far East. *Port Sudan*, the commercial port, and *Suakin*, the pilgrim's port, are outlets of the Middle Nile Basin, while farther south is *Massuah* on the Italian shore of *Eritrea*.

The Indian Ocean.—The similarity between the height of the land and the depth of the sea is well seen on the eastern coast. Under the heading of Surface it will be seen that Africa rises from a narrow coastal plain to a lofty tableland, and, corresponding to this, the map shows a narrow continental shelf descending rapidly to deep ocean depths. Notice in the large island of *Madagascar* that the steep eastern edge, rising from a narrow coastal plain, has a correspondingly narrow shelf descending rapidly to deep water, while the more gradual slope westward to the *Mozambique Channel* is bordered by a wider shelf. The value of this coast for trade is not only hampered by the want of indentations, but the coastal plain bordering it, except in the south-east, is malarial and unsuitable for white habitation. Hence *Mombasa*, the terminus of the Uganda Railway, is built on a small coral islet, which is connected to the mainland by a massive bridge. In the south *Delagoa* and *Algoa Bays* are two of the best harbours on this coast.

The Atlantic Ocean has no large openings, and the most important ports are situated where some river forms a natural route into the interior. In the north for a considerable distance the coast borders the Sahara, and a similar desert coast borders the Kalahari Desert in the south. Along the shores of the Gulf of Guinea, where there is a steep descent from the plateau to the coastal plain, European Powers have important possessions, and are carrying railways inland with a view to tapping the rich resources

of the interior. In the far south-west corner *Table Bay* has given rise to the important harbour of Cape Town, but this bay has had to be artificially improved by breakwaters to reduce the force of the winds and waves.

Influence of Coast on the Development of Africa.

This compactness of outline and deficiency of natural harbours have to a great extent prevented the earlier development of Africa. Being surrounded by water it should have an insular climate and plenty of ocean traffic, but these advantages are counteracted by—

- (1) High plateaux coming near to the sea and shutting out its climatic influence whilst also preventing trade with the interior.
- (2) As Africa lies for a great part in the tropics the coastal plains are unhealthy and unfit for white habitation.
- (3) Long lengths of coast-line, both in the north-west and south-west, border desert, where no trade is possible.
- (4) Where Africa nearly touches Asia the steep brink edges of the coast make trade difficult.

Islands.

These form two distinct groups, continental and oceanic. The continental islands are either continuations of the structure of the mainland, or else are allied to the mainland in their climate and other natural conditions. Each of these will be treated in detail with the regions to which they belong. These islands include: (1) The large island of *Madagascar*, separated from Africa by the *Mozambique Channel*, and connected in structure with the mainland through the *Comoro group of islands*; (2) the island of *Socotra*, which is a continuation of the structure which ends in *Cape Guardafui*; (3) the volcanic islands of *Fernando Po*, *St. Thomas*, and *Prince's Island*, of the same volcanic structure as the *Kameruns* on the adjacent mainland. Off the north-west of Africa, situated on submerged ridges and not far removed from the mainland, are the *Canaries* and *Cape Verde Islands*, while farther distant is the island of *Madeira*. These latter are subject

to climatic conditions similar to those on the mainland, although moderated by the sea.

Quite distinct from the above are the islands situated in the middle of the South Atlantic and Indian Oceans. These are in no way related to the continent, and are therefore oceanic islands. In the South Atlantic Ocean, on the submerged ridge which is situated between the African and South American shores, lie *Ascension* and *Tristan da Cunha*, while east of these is the volcanic island of *St. Helena*. These islands are all British possessions.

Ascension :—

This is a mountainous island of volcanic structure containing many extinct cones. Its climate is dry and healthy and its products are few. *Georgetown*, on the north-west, is the only harbour. Sea turtles found on the island provide material for a tortoise-shell industry.

Tristan da Cunha :—

This forms a plateau swept by storms and rain. Its population, numbering less than a hundred, is cut off from the outside world except for visits from an occasional man-of-war.

St. Helena :—

This island, 800 miles east of Ascension, is a vast volcano, the centre of the island forming the crater. It receives much rain from the south-east trades and grows quantities of potatoes. *Jamestown*, on the north-west, is a coaling station. This island is famous as being the place of Napoleon's exile from 1815 to 1821.

In the Indian Ocean, 500 miles east of Madagascar, on a submerged ridge, lies *Mauritius*, a British possession, having important steamship communication with Britain via Cape Town, India, and Australasia. The *Seychelles* and *Amirantes*, groups of volcanic islets lying to the north-east of Madagascar, are also British. *Reunion*, to the south of Mauritius, is a French possession.

Mauritius :—

The surface of this island consists of a low plateau interior descending to a low coast fringed by coral reefs. During the wet season river torrents carry

quantities of water to the coast. Much of the island is covered with forest. The climate is healthy, but in the damper parts malarial. Sugar is the chief export. *Port Louis*, on the north-west, has the best harbour. The island has successively been a Portuguese, a French, and a British possession. The French developed it, but it eventually became a British possession in 1810.

Reunion :—

This is a volcanic island with both extinct and active cones. Its fertile soil is capable of producing coffee and sugar. The population lives near the coast.

EXERCISES.

1. Show to what extent the coast features retarded the earlier development of Africa.
2. Show the relation of Africa to the land mass of Eurasia, and illustrate by a sketch map, inserting the four points at which Africa approaches Eurasia.
3. The chief harbours of the islands in the South Atlantic and Indian Oceans are situated on the north-west coasts. Can you suggest any reason for this?
4. Africa is practically an island. Explain why the oceans surrounding her shores have so little influence upon the climate.
5. From the Surface Map of the African continent show the relation between the heights of the land and the depths of the sea.

Surface.

A study of the Surface Map of Africa shows that this continent differs from all the others in having no great axis or axes of folded mountains, but consists of a mass of ancient rock tablelands, higher in the south and east, lower in the north and west. Draw a line on the Surface Map from the Congo estuary to Suakin on the Red Sea. This line will roughly divide the high tablelands of the south and east above 3000 feet from the lower plateaux of the north and west which are below that height, except in the far north-west, where the Atlas Range, really a continuation of the European mountain systems, is much loftier.

The ascent from the narrow coastal plain to the steep edge of the plateau on the south and east is by a series of steps or terraces.

From this edge the plateau has a general slope to the west, the descent from this to the Atlantic coastal plain being far less precipitous. The *volcanic Kameruns*, bordering the Guinea Coast, and the *Futa Jallon Highlands*, in which rise both the *Senegal* and the *Niger*, are two exceptions where the western mountains rise considerably higher.

Surrounding the Indian Ocean are other rock tablelands similar to those of Africa. Find on the Map of the World the plateaux of Arabia, the Deccan, and Western Australia. These are all of formation similar to Africa, and probably once formed part of an old continent which existed where now the Indian Ocean lies.

The arrangement of plateaux and the lack of any mountain axis prevent any definite water-parting. The *Nile* flows north to the Mediterranean, the *Congo* and *Orange* to the west coast, and the *Zambesi* to the east. The *Niger* rises in the west and flows inland, first north-east, and then south to the Guinea Coast. These form the great continental rivers of Africa, and will be dealt with in detail under the regions to which they belong, as will also the smaller rivers. Owing to the plateau formation of Africa, continuous navigation up these rivers is impossible because of the waterfalls which occur where the rivers descend from the plateau to the coastal plain.

Fig. 2 shows that the rift valley formation already referred to in the formation of the Red Sea is continued through the Eastern Plateau, where two long rifts bordered on either side by steep escarpments unite in the south to form a letter Y. In the western rift lie the long, narrow lakes of *Albert*, *Edward*, and *Tanganyika*, and in the southern extension *Lake Nyasa*. In addition to these are other large lakes, of which *Victoria Nyanza* is the chief. These are not in the rifts, but occupy depressions on the plateau. Both the rift and plateau lakes form the feeders of the three largest river systems of Africa. On the Surface Map notice that Lakes Albert and Edward drain northward to the Nile, which is also joined by a stream flowing from the *Victoria Nyanza*. Between the rift lakes and the latter are the lofty *Ruwenzori Mountains*, which form the

eastern edge of the western rift. Farther south find *Lake Tanganyika*, and draining from it the *Lukuga*, which flows to the Congo. This river breaks through the western escarpment of this rift. In the southward extension find the

Lake Ngami, the chief stream flowing to which is the *Kubango*. Both of these drainage systems are fed by summer rains, and during the dry season many of their rivers are only dried water-courses. The close connection between the river systems of Africa should be noticed on the map. The Aruwimi and Ubangi or Welle tributaries of the Congo nearly approach the Upper Nile, and the same streams of the Congo and the Bahr-el-Arab of the Nile are not far removed from the Shari drainage to Lake Tchad. This latter drainage system also nearly joins the Benue and Kaduna tributaries of the Niger. South of the equator the water-parting between the southern tributaries of the Congo and the northern ones of the Zambesi is very indefinite. This close connection is having an important influence on the direction taken by the railways, which are rapidly being carried into the interior of Africa.

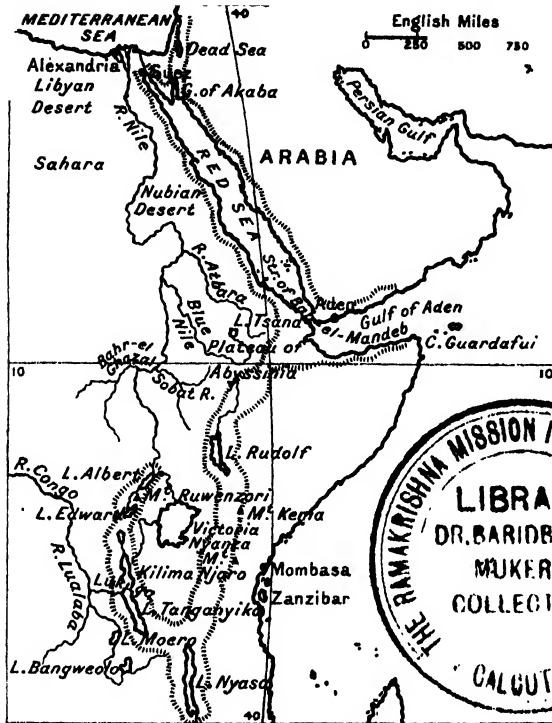


Fig. 2.—East Africa, showing Rift Formation.

Shire River, which carries the waters of *Lake Nyasa* to the *Zambesi*. The lakes in the eastern rift are smaller, and form inland systems of drainage such as *Lake Rudolf*.

On either side of the equator, bordering the Sahara and Kalahari Deserts, are two great basins of inland drainage. Find on the north, between the Congo, Niger, and Nile, the great *Lake Tchad* system, fed by numerous streams, many of which are intermittent, flowing only during the wet season. Of these streams the *Shari* is the chief, and rises in the higher ground which separates this basin from that of the Nile. Find on the map, in a somewhat similar position south of the equator, the drainage system of

The connection between the mountains of Southern Europe and those of North-West Africa have been shown already in Fig. 1, so also have the relations between the surface systems of Arabia and the African shores of the Red Sea, but these will be dealt with in greater detail in the study of the regions to which they belong.

EXERCISES.

1. The contour of 4000 feet forms roughly the limit of malarial fever in tropical lands. Above this the climate is healthy and Europeans can live. Deduce from this statement the parts of tropical Africa capable of supporting a white population.
2. To what extent are surface features responsible for the late development of the interior of Africa?
3. Show how the future construction of routes into the interior of Africa will be facilitated by the direction of the rivers.
4. In what ways are the surface features of Africa related to those of the Old World?
5. Draw a contrast between the surface features and drainage of Africa and Europe.
6. Compare the inland drainage systems north and south of the equator as regards their position, their rivers, and their proximity to other river systems.

Climate.

By comparing Maps 2 and 3, which show the January and July Isotherms, it will be noticed that, as the greater part of Africa lies between the tropics, it has a hot climate throughout the year, with a range of temperature of not more than 20° F. During July the region of greatest heat lies north of the equator, and Map 2 shows that there is in January an area south of the equator with a similar temperature.

Notice that the area in July which has a temperature above 90° F. is much larger than the similar area south of the equator in January. Notice on the map that the great land mass of Africa lies north of the equator, and is adjacent to the land mass of Asia, while south of the equator the continent is much narrower and is bordered by the ocean. In the former the influence of the sea is not felt, but in the latter it moderates the climatic conditions considerably.

Remembering that the equator cuts Africa into two, and therefore that the seasons occur at opposite times of the year on either side of it, we shall be able to account for the distribution of rainfall as shown in Maps 4 and 5. From these maps find the following regions:—

Belt of Constant Equatorial Rains:—

This extends on either side of the equator, stretching along the Guinea Coastal Plain in the north to the Congo Basin in the south. In this belt the area having greatest rain falls along the Guinea Coast in *northern* summer, and over the Congo Basin in *southern* summer, but at all seasons this region has a heavy rainfall.

Belt of Summer Rains:—

Notice that from May to October this belt of rain shifts north to include the Niger Basin, and that in the other half of the year it shifts south to include the Zambesi.

Desert Belts:—

North of the northern summer rain belt is a region which has less than 5 inches of rain throughout the year, and there is a similar area south of

the equator, bordering the west coast, having less than 5 inches in some parts and less than 10 inches in others.

Belt of Winter Rains:—

In the Atlas Region of the north-west is a belt having from 10 to 20 inches of rain in northern winter and less than 10 inches in summer. In similar latitudes in the south-west, that is, around Cape Town, there is a similar region having the greater part of its rainfall during southern winter.

Monsoon Areas of Abyssinia:—

Notice that the Abyssinian Plateau gets a heavy rain in summer when the winds blow inland to the low pressure centre, and a dry winter when the winds are outflowing. Similar climatic conditions prevail over a great part of the Eastern Plateau.

EXERCISES.

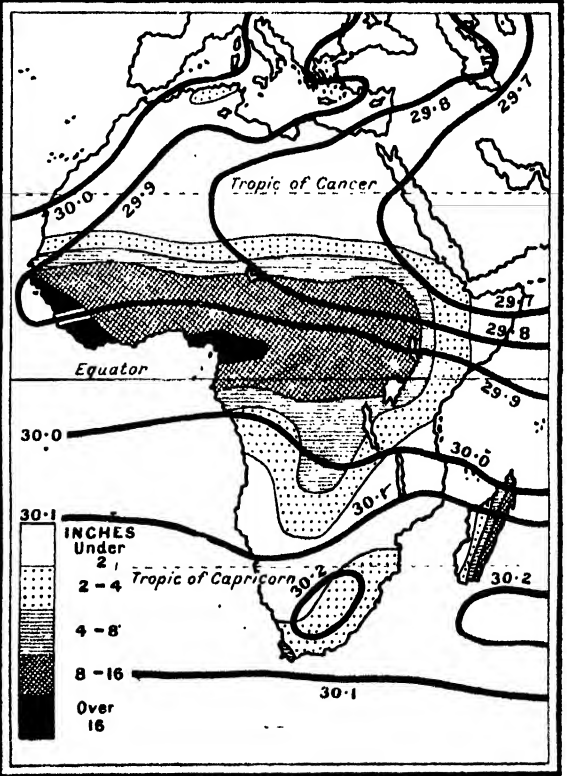
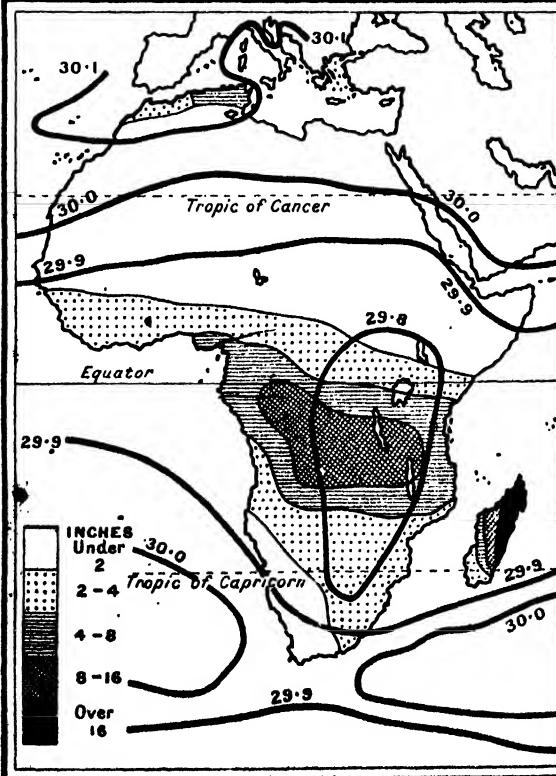
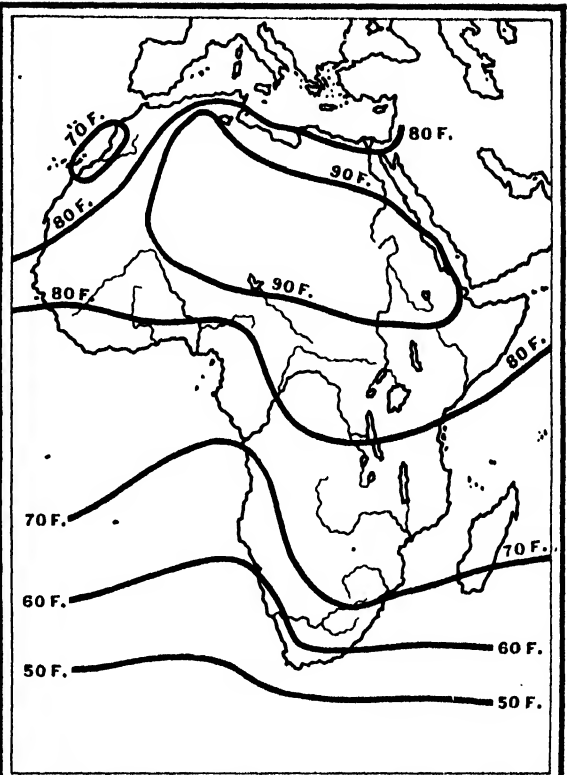
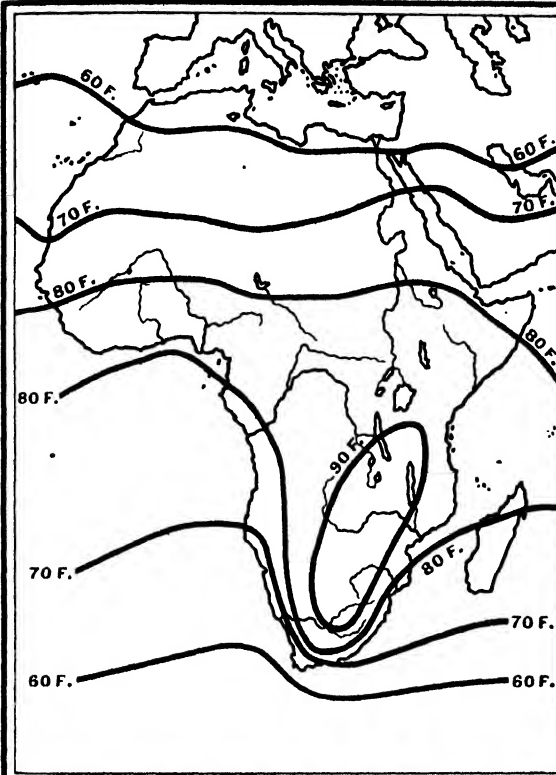
1. Name the parts of Africa which fall within the Belt of Constant Equatorial Rains.
2. Explain why the greatest heat and lowest pressure is north of the equator in July and south of it in January.
3. Name those rivers of Africa which overflow in summer. Give reasons in each case.
4. Explain why there is a belt of desert stretching across North Africa from east to west, but in similar latitudes south of the equator the desert is limited to the western part of the continent.

Vegetation.

Compare the Rainfall Maps with Map 6, showing the vegetation belts, and notice that the area of constant rain is the belt of dense *tropical forests*, while the summer rain belts north and south of it and the monsoon^{*} regions of the Eastern Plateau are *savannah* ⁴ *lands*, consisting of more open forests on the tropical forest edge, merging into park lands and poor grass lands bordering the desert. The summer rain belt on the veldt in the south produces *grass land*, which merges to desert in the drier west. The *desert areas* are devoid of vegetation, except coarse grasses and thick-leaved thorny plants capable of withstanding drought. The *winter*

JANUARY ISOTHERMS.

JULY ISOTHERMS.



JANUARY RAINFALL.

JULY RAINFALL.

rain areas in the far north and south, having hot, dry summers, are capable of supporting a *sub-tropical vegetation*.

Constant rain and intense heat produce the *tropical forests*, giant trees struggling upward to obtain light and air. The ground is covered with an undergrowth so thick that it is most difficult to penetrate it. The dense foliage of the trees causes the forest to be dark, while the thickness of the vegetation has crowded out both man and beast, the only inhabitants being *monkeys, reptiles and insects*. The ease with which food can be obtained, coupled with the effects of the moist heat, cause the people to be indolent and backward. The moist heat is largely responsible for malarial diseases, and the infection from these is carried by the mosquitoes which are prevalent in these regions. *Rubber* is the commercial product of the forest, but *timber (ebony and mahogany), oil palms, and medicinal plants* are valuable products. The unhealthy climate has prevented the collection of wild rubber by the white man. During recent years a species of upland rubber has been planted on the higher plateaux, and being produced in healthier surroundings is capable of being developed under European guidance.

The *Savannah Regions* are the home of many wild animals, of which the chief are the *lion, leopard, elephant, giraffe, zebra, rhinoceros, and crocodile*. Big game hunting attracts travellers to the Eastern Plateau, while ivory has been an important article of export since the arrival of the slave-dealers on the east coast. Towards the desert border the grass provides food for herds of *sheep and cattle*, and *ostriches* feed on the desert edge in the north and on the dry Karroos in the south.

Deserts.—The want of rain is responsible for the lack of vegetation in the *Sahara Region*. Wherever water is found, there the fertile soil produces *rice, millet, date-palm, and other cereals and fruit*. These fertile spots are known as oases, and they make journeys possible across the desert.

The *Kalahari Desert* differs from the Sahara in having a poor vegetation capable of supporting flocks and herds kept by the native Hottentots and Bushmen. This vegetation is largely due to underground supplies of water.

Mediterranean Regions.—In the Atlas Region of the north-west, and also in the neighbourhood of Cape Town, the warm, wet winters cause the growth of plants throughout that season, while the dry, hot summers enable *sub-tropical fruits* to ripen.

EXERCISES.

1. Draw a map showing the chief vegetation regions of Africa, and explain how far they are dependent on surface and climatic conditions.
2. The tropical forests merge gradually on either side of the equator through open woods into poor grass lands. Give the climatic causes of this.
3. What are the chief products obtainable from the tropical forests?
4. Name the chief wild animals of Africa. In what localities are they mostly found? Name the areas from which ivory is obtained.

Natural Regions.

From this general survey of the surface and climatic features of Africa, it will be

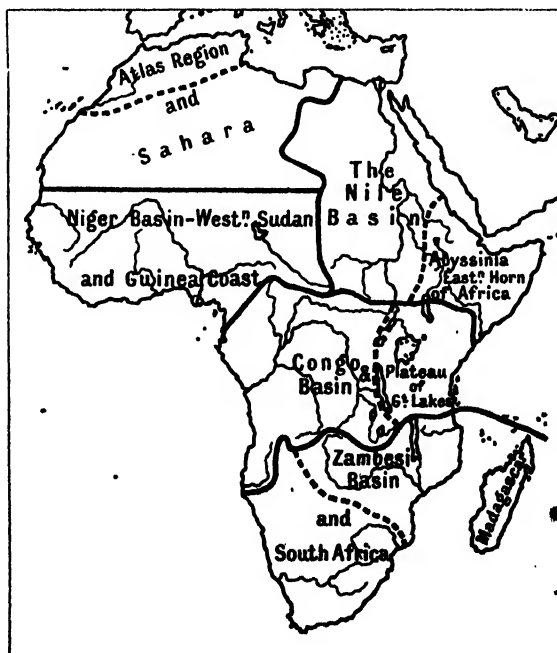
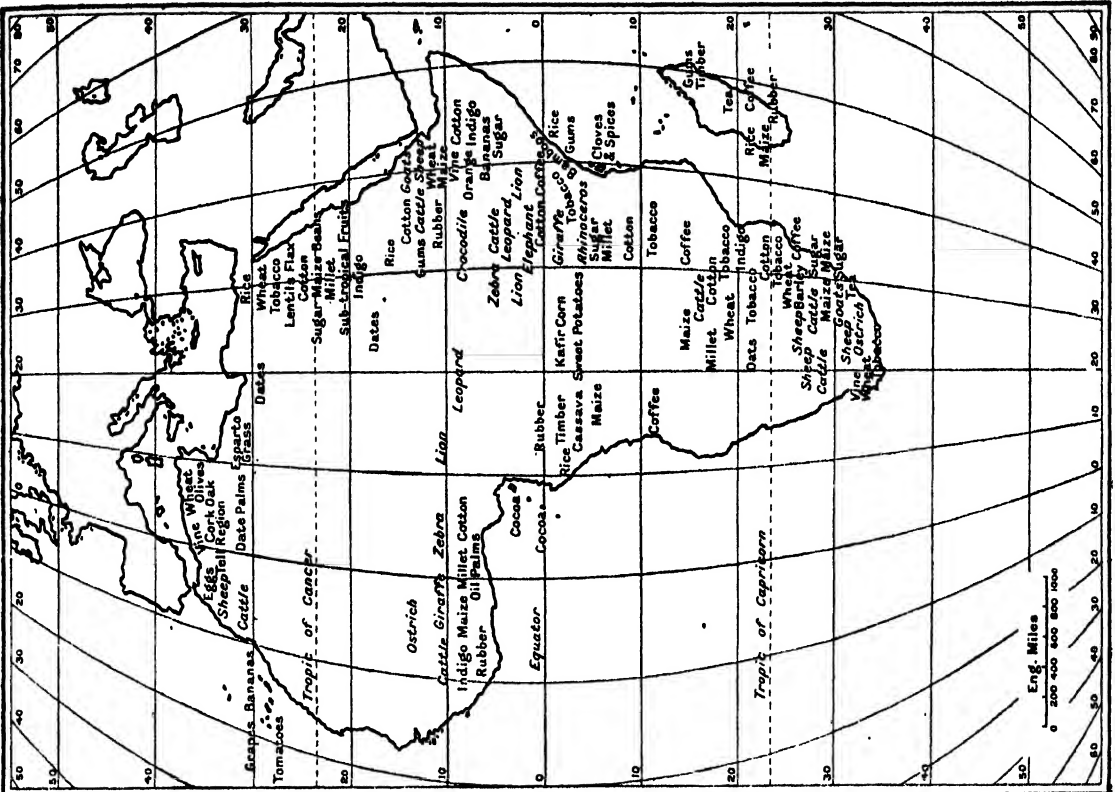
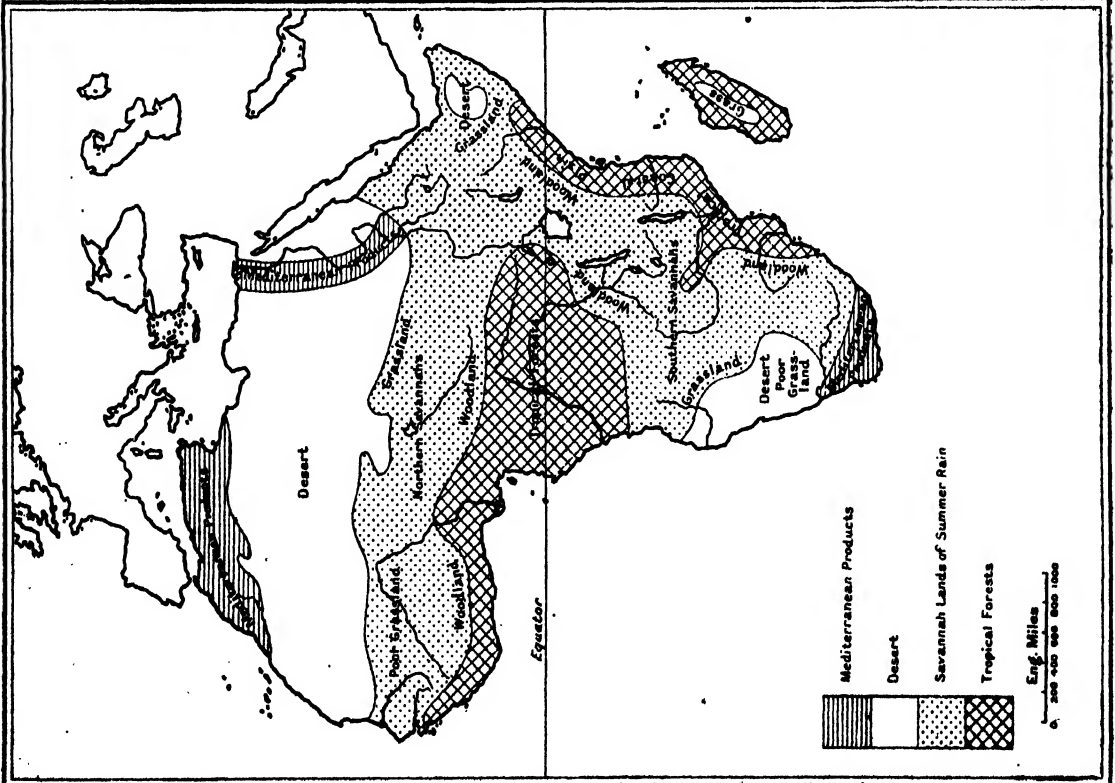


Fig. 3.

possible to divide the continent into the following natural regions. By comparing Fig. 3 with the Surface and Climatic Maps,



AFRICA—VEGETATION PRODUCTS.



AFRICA—VEGETATION BELTS.

the boundaries of each region should be noted, and the natural conditions which determine these divisions.

- (1) The Plateau of the Great Lakes.
- (2) The Congo Basin.
- (3) The Nile Region and Abyssinia.
- (4) The Niger Basin and the Guinea Coast.
- (5) The Sahara.
- (6) The Atlas Region.
- (7) The Zambesi Basin.
- (8) South Africa.

The Plateau of the Great Lakes :—

In this region will be included that part of the plateau east of the Congo Basin lying roughly between the parallels of 5° N. and 15° S. latitude. This region contains the loftiest mountains of the continent, *Kenia* and *Kilima Njaro* bordering the eastern rift. The lakes of this plateau have been shown to feed three of the largest river systems of Africa.

The Congo Basin :—

West of this plateau, and reaching to the inland drainage of Lake Tchad and the Nile Basin on the north, and to the water-parting between it and the Zambesi Basin on the south, is the enormous *basin of the Congo*. The greater part of this region is occupied by the *Belgian Congo State*, but *French Equatorial Africa* on the north and *Portuguese Angola* on the south reach to the mouth of the river.

These two regions form Equatorial Africa, and as valuable contrasts between tropical plateaux and tropical plains can be drawn from them, they will be studied together.

The Nile Region and Abyssinia :—

Rising in the Plateau of the Great Lakes, and flowing northward through the summer rain belt of *Egyptian Sudan*, and across the desert in *Egypt Proper*, to the Mediterranean Sea, is the Nile. The *plateau of Abyssinia*, with its steep buttress edge to the Red Sea, drains towards the Nile, and sends to it three important affluents. With this region will be included the coastal lands bordering the Red Sea, and the lower plateau of Somaliland forming the *Eastern Horn of Africa* and ending in *Cape Guardafui* and the island of *Socotra*.

The Niger Basin and the Guinea Coast :—

Draw two parallel lines across the map, one passing through the northern bend of the Niger, the second through the Guinea Coast. Between these two parallels lies the *Sudan* or "*Land of the Blacks*." The eastern portion, known as Egyptian Sudan, forms the southern half of the Nile Region, the remainder forms Western Sudan. In the west of this region notice that the plateau rises steeply to form a buttress edge bordering the Guinea Coast. From this the *Senegal* and *Gambia* flow to the west coast, and the *Niger* makes a great semi-circular sweep before breaking through the edge of the plateau to flow to the Guinea Coast. East of the Niger Basin is the *inland drainage system of Lake Tchad*, which forms a connecting link between this region and the Nile and Congo Basins. The steep slopes from the buttressed edge of the plateau to the malarial coastal plain present some marked contrasts with the plateau, in drainage, climate, products and people.

The Sahara :—

North of the northern bend of the Niger, and reaching to the Atlas mountain system, is a low tableland less than 1000 feet high, and crossed diagonally from south-east to north-west by the *Tibesti Range*. This forms the largest desert in the world, and is linked to the Asiatic deserts through the plateau of Arabia. This region reaches to the Mediterranean coast in the semi-desert state of *Tripoli*.

The Atlas Region of the North-West :—

This is a mountainous area allied in structure, climate and productions to the opposite shores of Europe. This region forms the states of *Morocco*, *Algeria*, and *Tunis*, all now under French control.

The Sahara and the Atlas Region will be studied together in order to show clearly the connections across the great Sahara barrier between Mediterranean lands and those of Africa proper.

The Zambesi Basin :—

South of the Congo Basin, and separated from it by a very indefinite water-parting, is another river which flows eastward across the plateau. This is the Zambesi, and the greater part of its basin is occupied by *Rhodesia*. *British Nyasaland*

and *Portuguese East Africa* will be included in this region.

South Africa:—

This region occupies all that part of the continent south of the Zambesi Basin, and includes the basins of the Orange and Limpopo Rivers, and also the inland drainage of Lake Ngami, on the borders of the Kalahari Desert. The greater part of it is occupied by the provinces of the *British Union of South Africa*, although *German South-West Africa* constitutes a large, thinly-peopled area in the west.

Peoples.

Africa has a population of 150,000,000, consisting of native black and white races, in addition to a large influx of European immigrants during the last fifty years. Fig. 4



Fig. 4.—Africa, Races of Mankind.

shows that the southern border of the Sahara roughly forms the dividing line between the white races akin to those of Western Asia and Europe and the black races. The *Berbers* and *Arabs* of the Atlas Region and the natives of Egypt, Abyssinia, and Somaliland are all people of the white race. The Arabs

are traders also across the desert, and have invaded the cattle pastures of the Niger Basin.

The Arabs found along the eastern coastal plain, many of whom have intermarried with the natives, were originally traders dealing in slaves and ivory, which they obtained from the interior plateaux.

Stretching in a parallel belt across the continent, except in the Eastern Horn of Africa, are the true *Negroes*, with deep black skins, protruding lips, and thick, woolly hair. Those on the plateau form a physically powerful race, but on the Guinea Coastal Plain the ill effects of the climate, coupled with the degrading influence of slave traders, have made these people both physically and morally backward.

In the Sudan there has been a large intermixture of Arabs and Negroes, and these mixed or *Negroid* races form a highly developed and physically powerful people with industrious and peaceful habits.

The *Hansa Negroes* of the plateau are skilful farmers, workers in metal, leather, and glass, weavers of blue cotton cloth, canoe builders and clever traders. These people and the mixed negroid races are capable, under the control of Europeans of developing the rich resources of the plateau.

South of the Sudan, and occupying nearly all the peninsular part of the continent, are the *Bantu* races, all speaking a similar language, but differing physically according to climatic conditions. Their skins are lighter in colour than those of the Sudan Negroes.

In the far south-west are the *Hottentots* and *Bushmen*. These belong to a race entirely different from the Bantus or Negroes, and have yellowish-brown skins and high cheek bones. They are probably descended from the earliest inhabitants of the southern part of the continent, but as European races pushed northward from Cape Town and other South African ports, and the physically powerful Bantu races of the plateau moved southward, so the *Hottentots* and *Bushmen* were driven towards the desert, where they exist as shepherds, feeding their animals on the scanty pasture.

History.

Africa, although forming part of the Old World, and in close proximity to the civilisations of Western Asia and Europe, had been so little explored until the last century that it was known as the Dark Continent. The northern shores played an important part in the early history of the world, and Carthage (Tunis) and Egypt were two of her ruling powers, but the great barrier of the Sahara offered an obstacle to the spread of civilisation.

Early in the fifteenth century the Portuguese devoted themselves to the discovery of a sea route to the East, and Bartholomew Diaz in 1488 and Vasco da Gama in 1498 sailed round the Cape of Good Hope, but these explorations only led to calling ports and trading settlements being made along the coast. It was not until the end of the eighteenth century that any systematic exploration into the interior took place, and Africa remained an unknown land until *Bruce*, *Mungo Park*, *Lander*, *Clapperton*, *Burton*, *Baker*, *Speke*, *Livingstone*, and *Stanley* made their journeys into the interior. Since that time great areas of Africa have come under European influence, and railways have been built and irrigation works constructed to develop its rich natural resources.

Chief Explorations into Africa:—

At the close of the eighteenth century Bruce traced the source of the Blue Nile, and Mungo Park the course and mouth of the Niger. Early in the nineteenth century we added to our knowledge of this region by additional explorations in the Niger Basin, and the discovery of the drainage system of Lake Tchad. In the middle of the century Livingstone explored Lake Ngami, and from thence travelled to what is now the plateau of Portuguese Angola, and traced the course of the mighty Zambesi. In his second memorable journey Livingstone ascended the Zambesi, and travelling by way of Lake Nyasa explored the eastern plateau and the upper course of the Congo, which he imagined at that time to be the source of the Nile. Seven years later Stanley corrected these impressions by tracing the whole course of the Congo. In addition to these discoveries, Burton and Speke had, earlier in the century, discovered Lakes Tanganyika and Victoria Nyanza, while Speke in a second

journey with Grant traced the courses of the Upper Nile.

Geographical Causes which retarded Exploration and Development:—

- (1) The Sahara barrier shut off the remainder of Africa from early Mediterranean civilisation.
- (2) Malarial coastal plains border the steep plateau edges of Central Africa, and the unhealthy climate prevented the white man from pushing into the interior.
- (3) The tropical lowlands are covered with thick forests, the undergrowth of which it is almost impossible to penetrate.
- (4) Owing to the plateau surface all the great rivers are impeded by waterfalls, which prevent through river navigation from the coast to the interior.
- (5) The lack of harbours makes landing difficult.
- (6) Many of the races which inhabit tropical Africa are savage and treacherous, and offered considerable resistance to early explorations.

Africa, a Continent of Contrasts.

Summarising what we have already learnt of the general geography of Africa, we find that not only can it be called "The Dark Continent" but it might also be termed "The Continent of Contrasts," for nowhere else in the world are there such striking differences.

Points of Contrast.

- | | |
|---|--|
| Lofty plateaux from which rise some of the highest peaks in the world. | Low coastal plains in close proximity to these plateaux. |
| Great rivers such as the Congo, Niger and Zambesi, which carry immense volumes of water to the ocean. | Inland systems of drainage bordering these great river systems, fed by intermittent streams. |
| Large fresh water lakes forming reservoirs to feed many of the largest rivers. | Large salt water lakes fed by many streams. |
| Regions of constant tropical rains. | Regions devoid of rain throughout the year. |
| Regions having summer rains. | Regions having winter rains. |

Dry, healthy plateaux.	Moisture laden malarial plains.
Thick forests of giant trees which rise from a dense undergrowth.	Tropical deserts, where owing to want of rain there is practically no vegetation.
Black races south of the Sahara border.	White races north of the Sahara border.
Bantu, races on the plateau are physically powerful.	Bantu races in some parts of the tropical lowlands are mere pygmies.
Africa contains some of the seats of the earliest civilisations.	The greater part consists of lands to which civilisation has only been brought during the last century.

EXERCISES.

1. Name the chief natural regions into which Africa can be divided, and by comparing Figs. 3 and 4, name the chief races which inhabit each region.
2. Name those regions north of the equator which resemble in surface, drainage, climate, or productions, the regions south of it. Show in what respects they differ, and give reasons for the differences you mention.
3. What is the cause of the Sahara Desert? Illustrate its nature as a barrier on the distribution of races and on the development of Africa.
4. In what ways has the exploration and development of Africa been rendered possible by modern invention?
5. Show the effect of surface and climatic conditions on the physical development of the Negro and Bantu Races in different parts of Africa.
6. Africa is a continent of contrasts. Illustrate this by a reference to the surface, climate, and vegetation of the continent.

European Influence.

Map 7 shows that the whole of Africa with the exception of Abyssinia is now under European control. In those parts where the white man cannot live European influence is very slight, and these lands are usually governed by native chiefs under the protection of one of the European Powers. On the healthier plateaux, however, these nations are constructing railways and roads, and introducing great irrigation schemes

with a view to increasing the rich resources of the continent. Medical science has now discovered that malarial fevers are caused by the bites of mosquitoes, and active operations are in progress for exterminating these insects. With the extinction of malarial fever these tropical lowlands could be made to provide food supplies and raw material for the dense populations of manufacturing Europe, although nothing will eradicate the evil effects of the moist heat which weakens the white man's constitution.

Find on Map 7 the European possessions in each of the natural regions into which Africa has been divided.

The Plateau of the Great Lakes :—

This is occupied by *British East Africa* and *Uganda* in the northern half, and *German East Africa* farther south. The islands of *Zanzibar* and *Pemba* off this coast are also British.

The Congo Basin :—

Belgium controls the greater part of the Congo Basin, but *French Equatorial Africa* on the north, and *Portuguese Angola* on the south, occupy the western plateaux and coastal plains reaching almost to the river estuary.

The Nile Basin :—

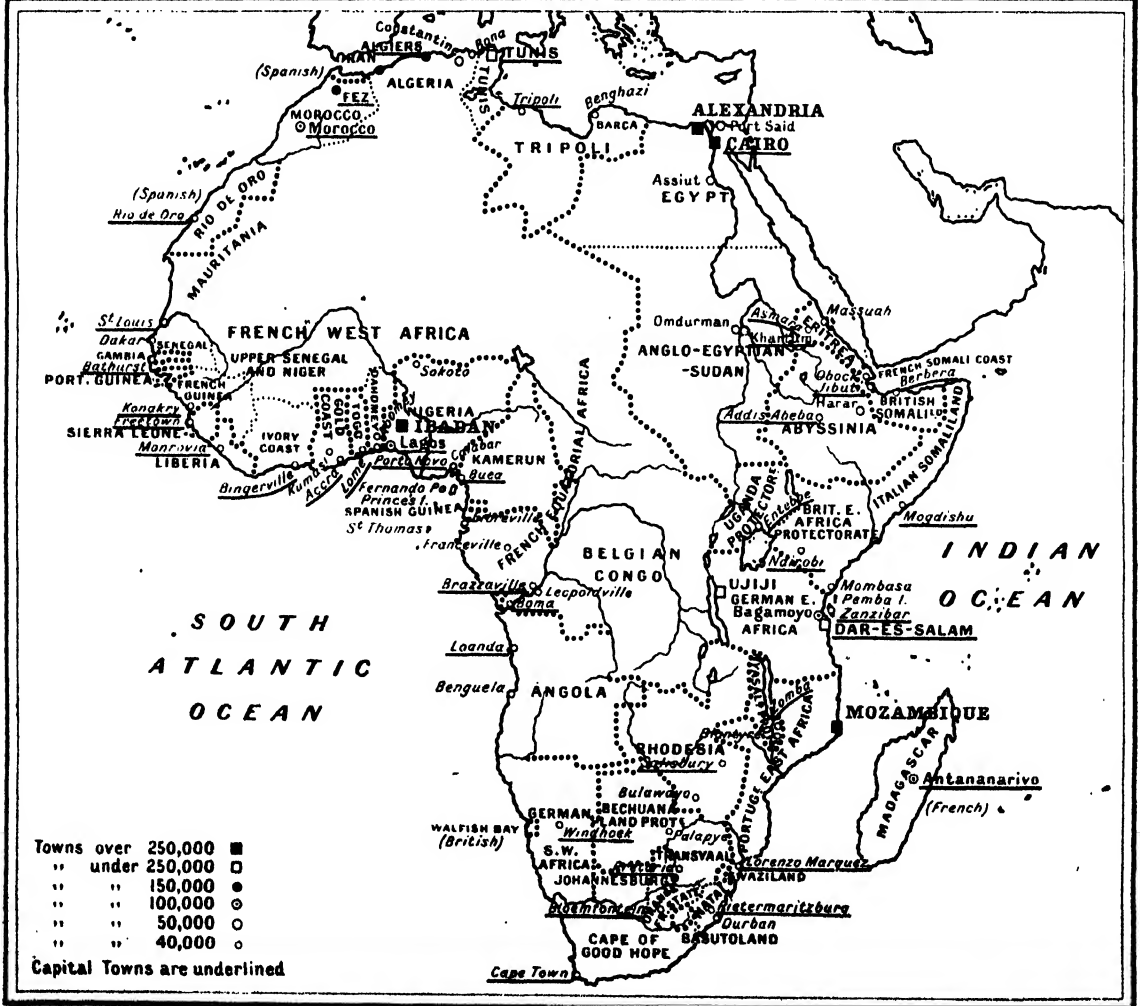
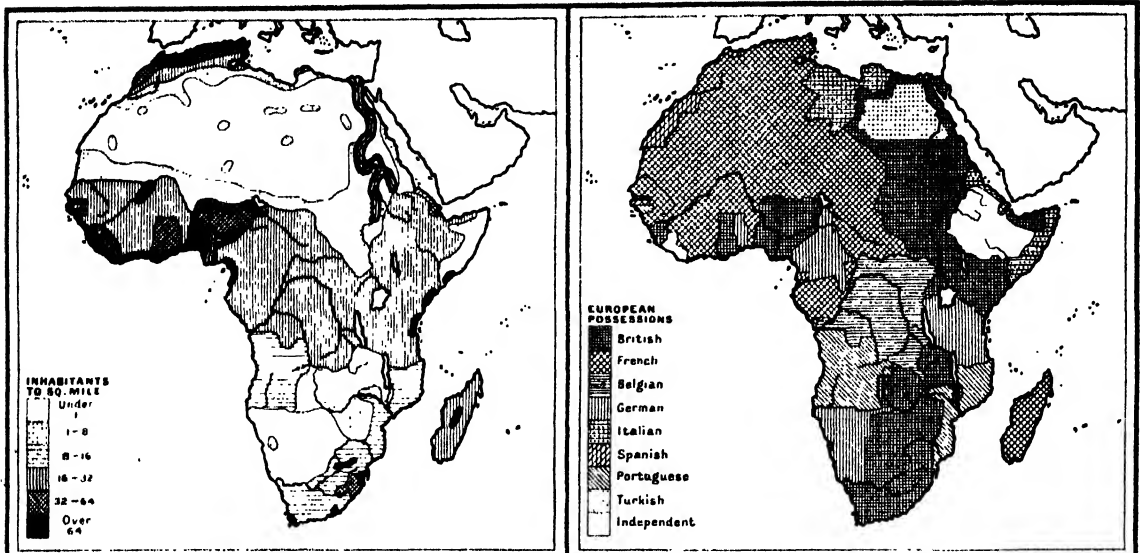
This is occupied by *Anglo Egyptian Sudan* and *Egypt Proper*, and although the latter is nominally under the protection of Turkey, yet British influence is paramount in both states. *Abyssinia*, largely due to its inaccessible surface, is the one country which has remained independent. Along the shores of the Red Sea is the Italian province of *Eritrea*, while at its southern entrance is the French colony of *Obock*. In the Eastern Horn of Africa are *British Somaliland* on the northern shore, together with the British island of *Socotra*, and along the eastern coast *Italian Somaliland*.

The Niger Basin :—

The French have the greatest influence in this region, holding the whole *Upper Niger* and *Senegal Basins* in addition to the coastal provinces of *Senegal*, *French Guinea*, the *Ivory Coast* and *Dahomey*. The British possessions include *Gambia*, occupying the lower basin of that river,

Map 7.

AFRICA—POPULATION AND EUROPEAN POSSESSIONS.



AFRICA—POLITICAL DIVISIONS.

Sierra Leone, shut off from the interior by French Guinea, the *Gold Coast*, and *Northern* and *Southern Nigeria*, together with the island port of *Lagos*. Germany holds *Togoland* and the *Kamerun* country, Portugal the islands of *St. Thomas* and *Prince*, in addition to *Portuguese Guinea*, while Spain possesses *Spanish Guinea* and the island of *Fernando Po*. *Liberia* is a small republic under the protection of the United States, founded by the latter to encourage the return of negroes from America after the abolition of slavery.

The Sahara :—

The greater part of this is under French protection. The *Libyan Desert* in the east is included in the government of Egypt. Spain has the small west coast province of *Rio-de-Oro* as well as the *Canary Islands*, while the semi-desert state of *Tripoli* was, until 1911, a possession of Turkey, but since the war with Italy the greater part of this control has passed into the hands of the latter. The *Cape Verde Islands* and *Madeira* belong to Portugal.

The Atlas Region :—

The *Atlas Region* is now almost entirely under French control. *Algeria* and *Tunis* have long experienced the good government of the French, who have constructed railway works, established irrigation systems, and in many other ways improved these lands. Until 1911 *Morocco* was an independent sultanate, but the bad government of the reigning Sultan caused the greater part of this state to be placed under French protection. Spain controls a southern coastal strip near her possession on the Sahara coast, and also much of the Mediterranean shore.

The Zambesi Region :—

The greater part of this river basin is occupied by *Northern* and *Southern Rhodesia*, and is controlled by the British Chartered Company of South Africa, under a charter granted by the British Government. *Nyasaland* is directly under the control of the British Government. The steep edges of the plateau and the coastal plain form *Portuguese East Africa*. *Madagascar* is a French possession.

South Africa :—

This consists of the *Cape of Good Hope Province*, *Orange Free State*, the *Transvaal*, and *Natal*. These now form a large self-governing state known as the *British Union of South Africa*. The *Bechuanaland Protectorate*, *Basutoland*, and *Swaziland*, largely occupied by native tribes, are directly under the British Government. On the west is *German South-West Africa*, although the port of *Walfish Bay* and a small territory behind it is British.

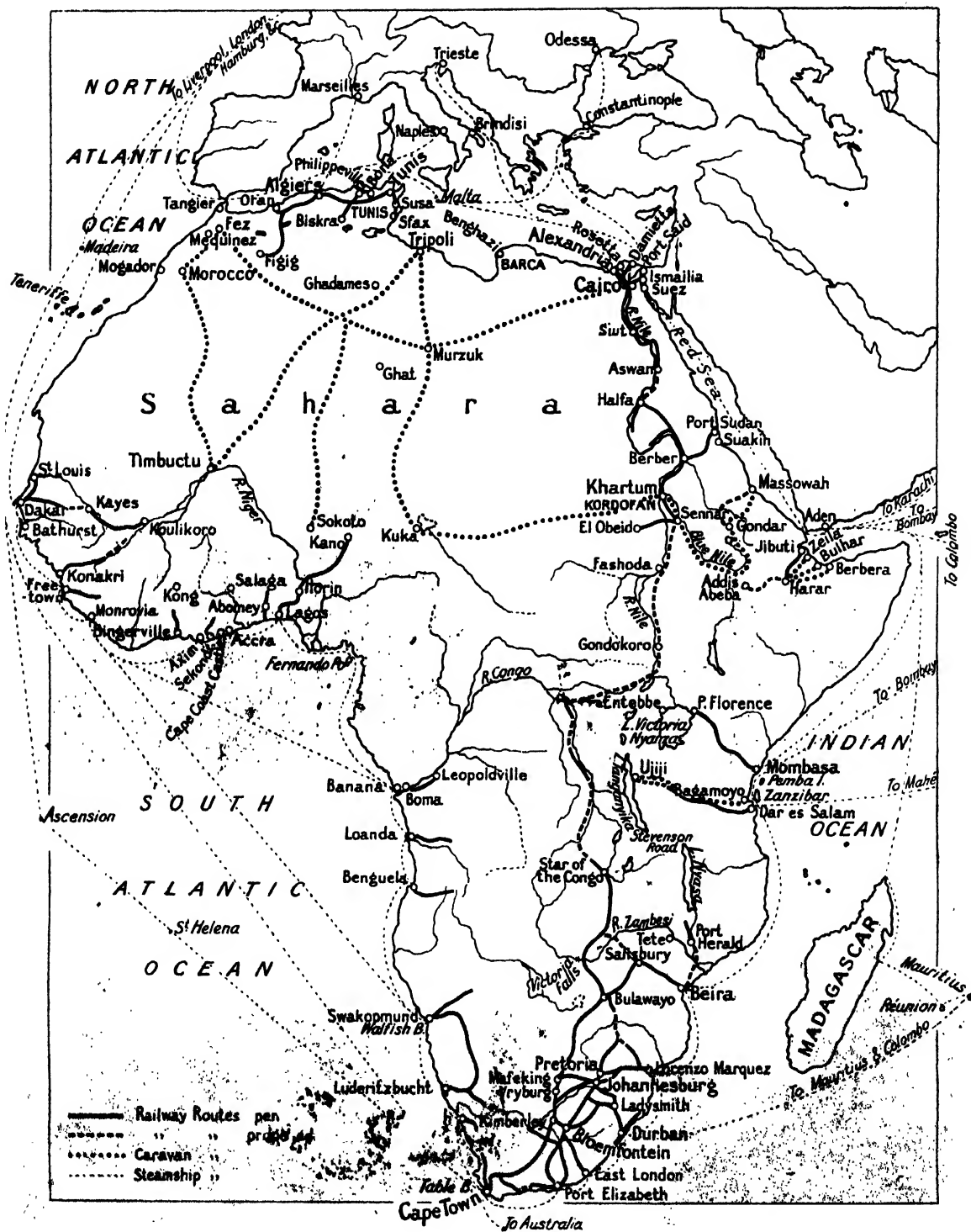
Routes.

Each of these European nations is endeavouring to surmount the obstacles of access to the interior, and railways have been made, while others are in course of construction, with a view to tapping the inland resources. The most important of these projected routes is that which proposes to link Cairo in the north to Cape Town in the south. The railway from Cairo southward has been constructed in two sections: (1) from *Cairo* to *Tonia* (10 miles south of Aswan), and (2) from *Halfa* to *Khartum*. This latter has now been continued to *Sennar* on the Blue Nile, and is now being carried to *Fashoda* on the Nile proper. The other end of this projected route reaches from *Cape Town* to *Bulawayo*, and from thence across the Victoria Falls of the Zambesi and the Kafue tributary of that river to the *Katanga* copper districts in the Congo Basin. From thence the railway will follow the line of the Western Rift till it reaches the line which is proceeding southward from Cairo.

Other important railways have been constructed, chief among which may be mentioned the Uganda Railway joining *Port Florence* on Victoria Nyanza to *Mombasa* on the coast, the railway from *Berber* to *Port Sudan* on the Red Sea, the network of railways in South Africa, the French line connecting the Senegal to the Niger, and the railways of Algeria and Tunis. These and many others are shown on Map 8, and will be taken in detail in the regions to which they belong.

In addition to railway communication, river steamers now navigate the Nile to *Lado* and *Gondokoro* at the northern edge of the Eastern Plateau. British steamers

Map 8.



ROUTE MAP OF AFRICA.

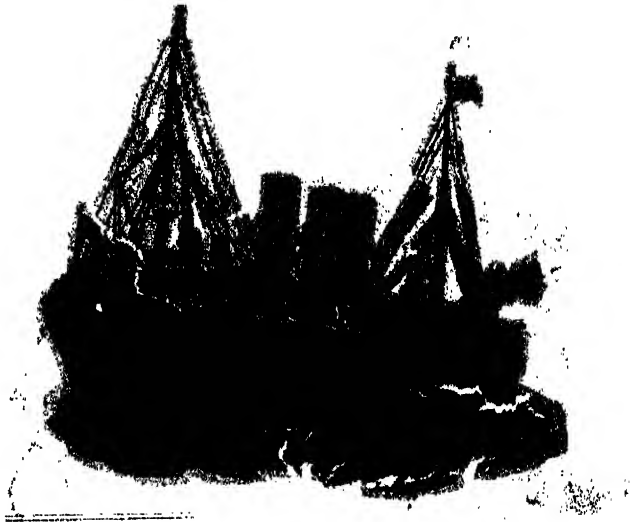
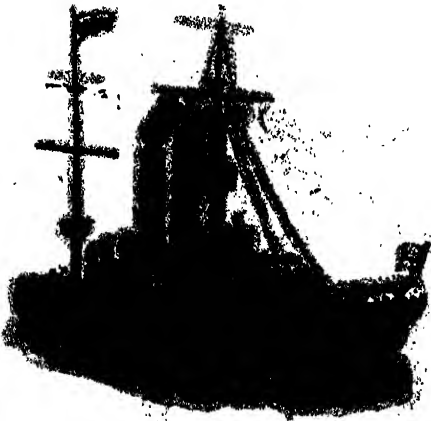
navigate the Lower Niger and its tributary the Benue, while the French use its middle course across the plateau. The Middle Congo is navigable for over 1000 miles, while vessels utilise the lower course of the Zambesi and the Shire tributary.

EXERCISES.

1. Name those European possessions where permanent white habitation is impossible. What are the value of such possessions?
2. Name the chief French possessions in Africa. Show the extent and the value of her possessions in the Niger Basin.
3. Name the chief British possessions in Africa. Name those parts which are

capable of supporting a permanent European population.

4. Name the chief Portuguese possessions. Can you explain why these are either coastal provinces or island possessions?
5. Draw a map of Africa south of the Congo, inserting—(1) the states forming the Union of South Africa; (2) those states directly controlled by the British Government; and (3) those administered by a company under the protection of our Government.
6. Why has Abyssinia remained independent while other parts of Africa have passed under the control of European nations?



AFRICA.

CHAPTER II.

THE PLATEAU OF THE GREAT LAKES AND THE CONGO BASIN.

CONTENTS.

Position.
Surface.
Rock Structure.
Climate.
Flora and Fauna.

Minerals.
Routes - Rail, River, and Caravan.
Commerce.
Peoples.
History.
Political Divisions—Distribution of Population.

MAPS.

9. Orographical Map.

10. Transparent Route Map, showing Vegetable, Animal, and Mineral Productions, and the Most Important Trade Centres.

11. Political Divisions.

Position.

Map 9 shows that this chapter deals with that area roughly extending from 5° N. to 15° S. latitude, and which therefore might be called *Equatorial Africa*. The contrast in elevation between the Plateau and the Congo Basin is clearly shown on the map by the difference in colouring.

The drainage of *Lakes Edward, Albert, and Victoria Nyanza* to the Nile on the north makes a connection between the Plateau and the Nile Region, while the drainage of *Lake Nyasa*, by the Shire River to the Zambesi, creates a similar connection with the basin of that river on the south.

The Congo is also closely related to the adjoining regions. Notice on Map 9 how nearly its northern feeders approach those of the *Bahr-el-Arab* tributary of the Nile, and the *Shari* drainage to *Lake Tchad*. The *Adamawa Highlands* separate the Congo from the Niger Basin on the west. In the south the northern feeders of the Zambesi are only divided from the southern tributaries of the Congo by an indefinite water-parting.

The close connection between the Congo and its surrounding basins is comparable

to the Amazon Basin of Equatorial South America. The northern feeders of that river are actually connected with the Orinoco system of drainage, while the water-parting which separates this river from the Paraguay-Parana system south of it resembles that of the Congo-Zambesi.

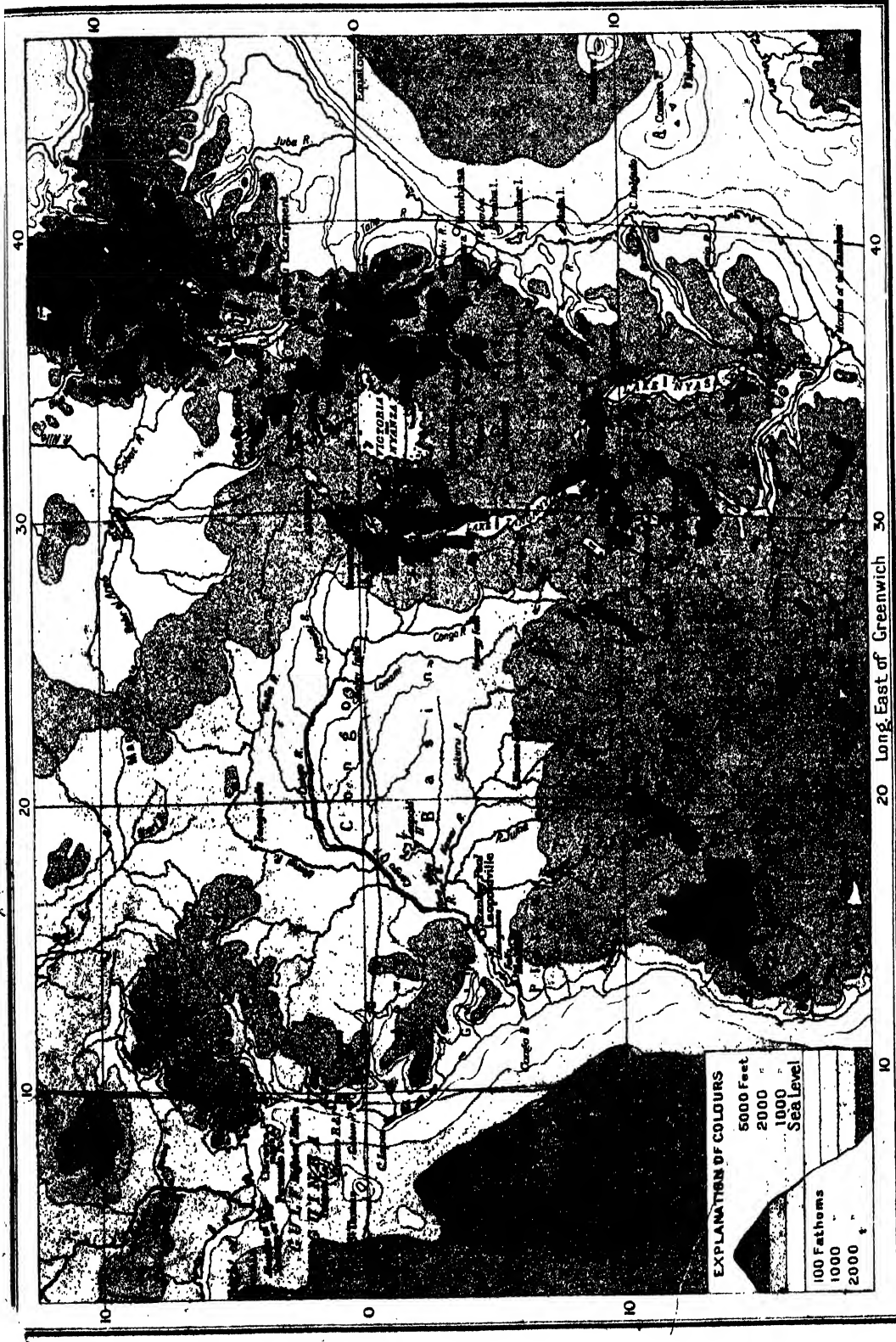
Politically Equatorial Africa is divided as follows:—

- (1) *British East Africa and Uganda* occupying the northern part of the Plateau of the Great Lakes, and extending from 5° N. latitude and the *Juba River* in the north to the mouth of the *Umba River*. The adjacent islands of *Zanzibar* and *Pemba* are also under British protection.
- (2) *German East Africa* occupying the southern part of the plateau, from the Umba River on the north to the *Rovuma River* and *Cape Delgado* in the south.

Although part of *Portuguese East Africa*, which occupies the coastal slopes of the plateau in the south, and *British Nyasa-*

THE GREAT LAKES AND THE CONGO.

Map 9.



Natural Scale 1:25,000,000 or 395 miles to the inch

W & A E Johnston, London & Edinburgh

land bordering the lake of the same name, are closely connected with this region, they will be studied with the Zambesi Region, of which they form a geographical part.

- (3) *The Belgian Congo State* occupies the basin of that river. It has very little coast-line on the west, because French and Portuguese possessions approach closely the river's mouth.
- (4) *French Equatorial Africa* occupies the plateau rim and the coastal plain north of the Congo Basin.
- (5) *Portuguese Angola* has a similar position south of the Congo estuary.

EXERCISES.

1. Show in what way the Eastern Plateau of Africa is a central region with which all the other regions are connected.
2. Draw a map of Equatorial Africa, and show the connection between the Plateau and the Congo Basin and the surrounding regions.
3. Show how the close connection of the river systems of Africa will facilitate internal communications.
4. How far do political boundaries in Equatorial Africa coincide with natural features?

Surface.

The eastern half of Equatorial Africa forms the Plateau of the Great Lakes. The plateau rises by steep escarpments from a narrow coastal plain, and has a gradual slope westward, descending abruptly along its western border to the Congo Basin. It has been shown in the previous chapter that this plateau is crossed by two great rifts. The easterly one, being a continuation of the Red Sea Rift, stretches from Eritrea to Lake Nyasa, where it is joined by the westerly one, which runs along the western edge of the plateau and curves eastward to join the first. The two rifts thus form a letter Y. In them lie long, narrow lakes, those in the westerly rift draining to the Nile, Congo, and Zambesi, while those in the Eastern Rift are land-locked and have no visible outlet to the sea.

The Coastal Plain and the Eastern Edge of the Plateau:—

South of Mombasa to Cape Delgado, the plateau is bordered by a narrow, unhealthy coastal plain covered with dense forests and mangrove swamps, from which the steepest escarpments of the plateau rise to over 4000 feet. Notice on the map that north of Mombasa, especially in the *Sabaki* and *Tana Basins*, the coastal plain widens considerably, while the steep edges of the plateau have been broken down by internal forces. This part of the plain is drier and healthier. East of the Great Rift lie the lofty volcanic masses of *Kenia* and *Kilima Njaro* (the highest mountains of this continent) and the *Aberdare Mountains*, while farther south the *Ugogo Plateau* forms a water-parting between those rivers flowing east to the Indian Ocean, west to *Lake Tanganyika*, or north to the inland drainage of *Lake Kiasszi*.

The rivers which drain the eastern slope of the plateau towards the Indian Ocean are for the greater part of their course unnavigable. The chief of these are the following:

The *Roruma*, flowing from the eastern edge of the Southern Rift.

The *Rufiji*, rising in the Livingstone Mountains and flowing through German East Africa.

The *Pangani*, draining the southern slopes of Kilima Njaro.

The *Sabaki*, from the eastern edge of the Great Rift.

The *Tana*, flowing from the southern slopes of Kenya.

The *Juba*, which forms the northern boundary of British East Africa.

The *Usambura* and *Usagura Mountains* bordering the eastern edge of the plateau rise to 6500 feet, and form parallel ranges of granite and ancient rocks running from south-west to north-east.

The *Ugogo Plateau* is somewhat dry and barren. It is 4000 feet high, and stretches 150 miles inland, becoming more arid towards the interior.

Kilima Njaro is a huge, extinct, volcanic cone 60 miles from north to south and 170 miles in circumference, forming two peaks, one 17,500 feet, the other 19,700, feet above sea-level. These snow-clad peaks, dazzling in the bright sunshine, appear to be covered with molten silver. A marked contrast is exhibited between

the northern and southern slopes. The latter, swept by the south-east monsoons, are remarkably fertile, while its northern slopes are dry.

Kenia forms part of a volcanic mountain chain running from east to west. Its twin peaks, rising to 16,000 feet, are snow-clad, and the high valleys of this range contain great glaciers.

The *Aberdare Mountains*, lying west of *Kenia*, run from north to south, parallel for 60 miles to the *Kikuyu Escarpment*. These mountains range from 10,000 to 14,000 feet above sea-level. This region contains patches of thick forest alternating with clumps of flowering shrubs or valuable pastures, the latter supporting herds of cattle. The whole region presents a striking difference to the desert conditions which prevail north of *Kilima Njaro*.

The *Rufiji River* forms a vast delta with many shifting channels, but has a navigable course of over 100 miles. The *Rovuma River* is navigable for a considerable distance, while the *Tana*, owing to the wider coastal plain in the north, is navigable for 360 miles. The *Sabaki*, which is navigable for over 60 miles, forms a natural highway to the interior plateau, and the *Uganda Railway* follows its valley for some distance.

The Eastern Coastal Plain is bordered by reefs of coral, except where the outlets of the above rivers have caused breaks in the coral formation. Here are situated the chief harbours, from which routes lead to the interior. The islands which border this coast are of the same coral formation, *Zanzibar*, *Pemba*, and *Mafia* being the largest. The port of *Mombasa*, the chief port of British East Africa, is built on a coral island, and is connected with the mainland by a large viaduct.

The Eastern Rift :—

The plateau forms two steep brinks bordering the rift, the eastern brink known as the *Kikuyu Escarpment*, and the western the *Mau Escarpment*. On the Surface Map of Africa notice the right angular brink edge of the Red Sea Rift. From this the Eastern Rift is continued southward, and its course may be traced on the map by following the river *Hawash* and *Lakes Rudolf, Baringo, Naivasha*, and *Natron* to *Lake Nyasa*. All these, with the exception of *Lake Nyasa*, are land-locked and have no visible outlet.

The elevated escarpments, watered by clear, perennial streams draining their steep slopes, are sufficiently lofty to be free from malaria, and this, coupled with the beautiful scenery, should attract a settled European population.

Of the lakes in the Eastern Rift *Rudolf* is the largest, having an area of 3000 square miles, and stretching 600 miles from north to south. It is the least elevated of these lakes.

A writer thus describes *Lake Baringo* :—
“Imagine if you can a trough 3500 feet above the sea, 20 miles broad, with mountains rising on either side to 9000 feet. In the centre of this depression is a dazzling expanse of water glittering like a mirror. Round the lake a strip of pale green indicates the marshy border, while the outer circle of dark green extending up the sides of the mountain sides is formed by forests of acacia trees.”

Mt. Elgon is the highest part of the *Mau Escarpment*, rising to 14,200 feet. The sides of this mountain contain many natural caves.

The Plateau :—

Between the Eastern and Western Rifts the tableland reaches its greatest elevation on the *Unyamwezi Plateau*, a hilly tableland watered by streams flowing west to *Lake Tanganyika*. The plateau also rises again in the fork between the Eastern and Western Rifts, where are the *Livingstone Mountains*. In addition to the lakes in the rifts there are large lakes occupying depressions on the plateau. Of these, *Victoria Nyanza* is the largest and most important. This vast sea of fresh water, almost as large as Scotland, lies 3800 feet above sea-level and is 270 feet deep. Its chief feeder is the *Kagera*, which rises in the lofty *Ruwenzori Mountains* bordering the Western Rift. This lake, lying in the belt of tropical rains, acts as a great reservoir to the Nile, enabling that stream to maintain its flow throughout the year (see Chapter III.). *Lake Eiassi* is another, but smaller, depression at the western foot of the *Mau Escarpment*, while *Lake Rukwa*, lying between *Nyasa*, *Tanganyika*, and the *Unyamwezi Plateau*, varies in size with the seasons.

The greater elevation of the *Unyamwezi Plateau* causes a larger volume of rain and consequent increased fertility. This latter accounted for the growth of an

important Arab state with a centre at *Taborah*. The inhabitants were not only skilful farmers, but carried on a large trade with the coast.

The *Kagera*, which drains the eastern slopes of the Ruwenzori Mountains, is the true source of the Nile. After receiving many tributaries it flows to the western shore of Victoria Nyanza as an imposing stream, and is by far the largest of all the affluents of the lake.

Victoria Nyanza is 800 miles in circumference, and its shores are indented by many bays and inlets, while the lake itself is dotted with clusters of verdant islands. Its outlet is the *Victoria Nile*, which carries all the surplus water northward to the Mediterranean. Immediately after leaving the lake the river drops over the *Ripon Falls*, and then widens out into *Lake Choga*, which contains many islets of floating vegetation or *sudd*. From this lake the river flows north-westward, and descends over the *Murchison Falls*, beyond which it receives the waters of Lake Albert.

Lake Eiassi, 90 miles long and from 20 to 30 miles broad, forms a basin of inland drainage, receiving most of its affluents from the west.

The Western Rift:—

From the Victoria Nyanza the plateau rises to form the brink edge of the second great fault, which extends from the Nile southward to Nyasa. In this rift lie *Lakes Albert* and *Edward*, draining northward to the Nile, *Lake Kivu*, which is connected with *Lake Tanganyika*, and *Nyasa* which lies in the southern extension. Notice the river systems with which these lakes are connected.

The *Ruwenzori Mountains* border this rift on the east, and separate Lakes Albert and Edward from Victoria Nyanza. The western edge of the rift borders the Congo Basin. In the rift are the volcanic *Mfumbiro Mountains*, which divide the drainage north to the Nile from that of Tanganyika west to the Congo.

Lake Edward receives its affluents from the Mfumbiro Mountains, while the Semliki River is its outlet. This stream descends 1000 feet in a course of 150 miles, flowing through a region of dense vegetation to Lake Albert, where it forms a delta.

Lake Albert is about 100 miles long and 25 miles wide, shut in on either side by

lofty mountain walls, down the steep sides of which flow rushing torrents. From this lake the Nile carries the waters of the rift valley lakes and also of Victoria Nyanza to the plains of Sudan, to which it descends by falls at *Gondokoro*.

The *Ruwenzori Mountains*, when fully surveyed, will probably be found to be the highest mountains of Africa. They divide the Western Rift from the depression of Victoria Nyanza, and therefore the drainage of the western slope flows to the Nile *via* Lakes Albert and Edward, and that of the eastern slope, *via* the *Kagera*, reaches the Nile through Victoria Nyanza. The highest part of the ridge contains vast glaciers, and the peaks are covered with perpetual snow.

The *Mfumbiro Mountains* are of volcanic origin, containing both extinct and active cones. They lie between the Kivu and Edward lakes. The whole of this district is dotted with volcanic features of comparatively recent origin.

Lake Kivu lies midway between Lakes Edward and Tanganyika. It is a fresh-water lake containing many bays and creeks, and is drained southward through the rift to Lake Tanganyika.

Lake Tanganyika, 400 miles long, is the longest fresh-water lake in the world. It occupies the lowest part of the Western Rift. It resembles Lake Nyasa in shape, and is devoid of islands. It is now connected to the Congo by the Lukuga, but probably in past ages formed a land-locked basin.

Lake Nyasa, in the southern extension, lies in a deep trench, the eastern sides of which rise steeply to the Livingstone Mountains, 10,000 feet high. These present a striking contrast to the lower western slopes, which are 4000 feet lower. The lake resembles Tanganyika in shape and geological formation. It is 350 miles long (as far as from London to Glasgow). Mountain torrents descend from its east side, while slower flowing streams flow from the lower west. The lake is devoid of islands, and has only a few creeks which are safe for anchorage.

The long, narrow lakes in the Western Rift valley are of greater value commercially than the broad, shallow depressions on the plateau, because—

(1) They form better reservoirs ~~than the broad depressions~~ because their narrow shape

- renders them less liable to evaporation.
- (2) They provide a serviceable means of communication owing to their greater length and lower level.

The Congo Basin :—

The western brink of the Western Rift forms part of a plateau rim which surrounds the Congo Basin on all sides. This plateau rim, rising from 3000 to 6000 feet, nowhere forms lofty mountain ranges, but acts as a water-parting, shutting off this basin from that of the Zambesi on the south, that of the Nile on the north-east, the Shari drainage to Lake Tchad on the north, and the Niger Basin on the north-west.

The great depression in the centre forms a low tableland with a gradual slope towards the west. It probably once formed the bed of an inland sea, to which the present tributaries of the Congo flowed. The torrential, equatorial rains of this region collected in this basin, and at last reached the level of the western coastal rim and overflowed, forming great cataracts in their descent to the Atlantic Ocean. The level of the rim was gradually eroded to the level of what are now the *Livingstone Falls*, and this equatorial inland sea was emptied to the ocean, *Stanley Pool*, with an area of 100 square miles, alone remaining. The main stream has a navigable course of over 1000 miles through this depression, from Stanley Falls to Livingstone Falls. The latter are situated where the river breaks through the coastal rim. All the tributaries are obstructed by rapids where they descend from the plateau to the depression.

The Congo Basin drains an area of 1,600,000 square miles, a little less than that of the Amazon Basin, and equal to nearly half the area of Europe, while two of its tributaries, the *Kasai* and the *Ubangi*, drain an area greater than that of the British Isles.

The proximity of the Congo and its tributaries to those of the surrounding basins must facilitate the future development of this area. Notice on the map that the great northern Ubangi or Welle tributary of the Congo rises on the outer western slope of the rift near to Lake Albert, while the northern feeders of the same tributary are also separated from the

Bahr-el-Arab tributary of the Nile and the Shari drainage to Lake Tchad by the *Mangayat Mountains*. Farther south the Aruwimi is only divided from the Semliki River by the brink edge of the rift. In the south the plateau forms a very indefinite water-parting between the tributaries of the Congo and Zambesi Basins.

The River Congo.

Upper Congo. The Source to Stanley Falls :—

The Congo rises in the *Chingambo Highlands*, between Lakes Tanganyika and Nyasa, where it is known as the *Chambezi*. It flows first in a south-westerly direction to *Lake Bangweolo*, receiving many other feeders from the highlands. Leaving Bangweolo at its southern end as the *Luapula*, the river turns north to *Lake Mweru*, descending 700 feet by dangerous cataracts in this 300 miles of its course. Beyond Lake Mweru the river, now known as the *Luvua*, has a precipitous course to its confluence with the *Lualaba*, the latter stream carrying a large volume of water from the Congo-Zambesi water-parting, and flowing through a chain of lakes. North of the lake the Congo receives the *Lukuga*, which during recent times has carried the surplus waters of Lake Tanganyika. At its confluence with the main stream it forms a considerable delta. Between this confluence and Stanley Falls the river flows northward through an equatorial forest region and receives many affluents from the slopes of the Western Rift. In this part of its course, although the river is from 1 to 2 miles wide in places, navigation is impossible, because of the *Nyangy Falls* and other rapids. *Stanley Falls*, on the equator, are 1500 miles from the source of the Chambezi. The seven rapids which here completely obstruct navigation divide the Upper from the Middle Congo.

Lake Bangweolo occupies a shallow depression on the plateau, and changes its form and size with the seasons. Discovered by Livingstone in 1868, it will always be of interest to British peoples, because on its southern shores the noted African explorer spent the last hours of his life.

Lake Mweru, although smaller than Bangweolo, is deeper, and not a depression

of the plateau. It lies at the same level as Tanganyika, and is only 100 miles distant from it.

Middle Congo. Stanley Falls to Livingstone Falls:—

This part of the river's course forms a navigable waterway 1000 miles in length, and receives over twenty large tributaries, which cause the river to form a majestic stream, 10 miles broad in places. Notice that below Stanley Falls the river receives on its left bank the long tributary *Lomami*, which rises in the Congo-Zambesi divide. The *Aruwimi* and other tributaries rise on the western slopes of the rift, between Lakes Albert and Edward, and join the Congo on the right bank. These tributaries flow through dense equatorial forests, and being obstructed by rapids are of little value for commerce. The river now flows due east, and before receiving its largest northern tributary, the *Ubangi*, turns south and crosses the equator. 70 miles above Stanley Pool, find on Map 9 the *Kwa* tributary, which is not really a river but a narrow channel, one-third of a mile wide, collecting the waters of a number of tributaries which drain an area equal to that of France. Of these streams the *Kasai* forms the southern artery of the Congo Basin, and to it flow many large tributaries, of which the chief are the *Sankuru*, the *Juma*, the *Mfini*, and the *Kwango*.

The *Ubangi* rises on the Congo-Nile water-divide, where it is known as the *Welle*. This river drains a densely peopled, fertile region, containing woods, pastures, and cultivated fields of maize and bananas. The *Zongo Falls*, where the river turns south, offer an obstacle to navigation, but this difficulty is surmounted by portages round the rapids. This river forms a great navigable waterway leading to the basins on its northern borders, which have already been mentioned. Between the *Ubangi* and the *Aruwimi* tributaries the region is covered with dense impenetrable forest.

The *Kasai* rises in the Congo-Zambesi water-parting, and first flows east near the land-locked *Lake Dilolo*, then turns north, descending the *Wissman Falls* before receiving the *Lulua*. Later the large *Sankuru* tributary joins it. Notice on the map the long westward flowing *Mfini*, which, before its confluence with

the *Kasai*, receives the drainage of *Lake Leopold II*. Near this notice the confluence of the *Kwango*. This river flows from the eastern foot of the Western Plateau. Its course is obstructed by many rapids, as it descends 4000 feet in 600 miles, although for the last 200 miles the river is navigable. In part of its course it forms the boundary between Portuguese Angola and the Belgian Congo.

Lower Course. Livingstone Falls to Mouth:—

Below Stanley Pool the river enters a narrow gorge, and breaks through the edge of the plateau in a number of falls, of which the Livingstone Falls are the chief. The river has a navigable estuary 120 miles long and from 5 to 6 miles broad. The great volume of water carries the alluvium 300 miles out to sea, and much of it is used in forming shifting sandbanks through which the river is constantly cutting fresh channels.

The Falls form a great barrier, preventing further inland access, and the railway, which has now been built from Matadi to Leopoldville, was a primary condition necessary to any development of the interior. There are no less than thirty-two distinct falls, and the river descends in this part of its course 900 feet in 170 miles. The immense volume of mud brought down by the river may cause it in the future to build up a delta which will rival in size those of the Mississippi and the Nile.

The Western Plateaux.

On either side of the Congo estuary these plateaux form the rim of the Congo depression. On the north side they rise by terraces from a low coastal plain to the interior plateau, and seen from the plain look like parallel ridges running from north to south. The plateau reaches its greatest height in the *Crystal Mountains*, 4500 feet above the sea. The equatorial rains, which fall in this region, give rise to several rivers, of which the *Gabun* and the *Ogowe* are the chief. Both of these streams have an upper navigable course on the plateau, a middle course obstructed by rapids, and a lower navigable course.

The *Gabun River* has one of the best harbours on the west coast, and is

navigable for large vessels; the river itself is also navigable to the foot of the escarpments.

The *Ogowe* is a large river 700 miles long. It brings down a large quantity of alluvium from the plateau to the low coastal plain, where it has built up a vast delta and created *Cape Lopez* with its deposits.

South of the Congo estuary the coastal plains are wide, but narrow farther south towards Mossamedes. From the plains the ground rises in steep terraced escarpments parallel to the coast, and reaching to 6000 or 7000 feet, from which they slope gradually to the interior. The two chief rivers draining this plateau are the *Kwanza* and *Kunene*, which, like the rivers north of the Congo estuary, have an upper and a lower navigable course, separated by rapids.

Find on the map the *Bihe Plateau*, and notice that it forms the divide between the Congo, Zambesi, and Coastal Plateau Basins. From this plateau the *Kwanza* makes a semi-circular sweep of over 700 miles to the coast, forming rapids where it descends the steep escarpments, and having a lower navigable course of 100 miles across the plain. The other large stream, the *Kunene*, rises south of the same plateau. It is long, and receives a large quantity of water from the *Chella Range*, but much of this is evaporated in the saline depression of *Etosha Pan*.

Rock Structure.

The Plateau of the Great Lakes is composed chiefly of ancient rock masses able to withstand denudation, and probably forming the remains of a much greater tableland. This plateau has been subjected to vast internal earth movements, which not only caused the sinking of the surface in the two great rifts, but in other places has caused the lowering of broad areas of land, as along the coastal edge of the plateau in the north-east. Similarly, the depressions on the plateau occupied by lakes such as Victoria Nyanza, were caused by internal forces. These earth movements are responsible for lines of weakness, from which huge volcanoes have poured out broad sheets of volcanic lava, thereby raising the level of the country. Extinct volcanic masses, such as Mt. Elgon, Kenia, and Kilima

Njaro, with their vast craters, are monuments to the force of these eruptions. The crater of the latter is now filled by a glacier, the waters of which feed the Pangani. Volcanic remains are also found on the plains. Traces of recent volcanic eruptions may be found near Lake Naivasha, while in the Mfumbiro district active volcanoes are found, and fumaroles and hot springs testify to latent volcanic action.

The greater part of the plateau surrounding the Congo Basin consists of sandstone, with quartz and other hard rocks. The depression is overlaid with alluvium, thus proving that it was once covered with water. The plateaux on the west show no signs of volcanic activity, but there are eruptive rocks in the south.

Chalk and limestone are found on both the east and west escarpments of the plateau, and also near Lake Tanganyika.

The mountains rising from the Eastern Plateau are either—

- (1) Extinct volcanic masses. *Example:* Kenia, Kilima Njaro, and Mt. Elgon.
- (2) Active volcanoes. *Example:* The Mfumbiro district of the Western Rift.
- (3) Raised up masses of hard rock able to withstand denudation. *Example:* The Ruwenzori Mountains.
- (4) Brink edges of the rifts. *Example:* The Mau and Kikuyu escarpments of the Eastern Rift.

EXERCISES.

1. Describe the surface and drainage of Equatorial Africa east of the Great Rift, and show the value of its rivers for internal communications.
2. Compare and contrast the surface features and drainage of the Eastern and Western Rifts.
3. Describe the lakes of the Eastern Plateau. Show how they differ in shape, structure, and drainage, and state the value of each commercially.
4. Justify the statement that the Plateau of the Great Lakes is the source of most of the large rivers of Africa.
5. Describe Victoria Nyanza, and show its value to the Nile region.
6. Describe the surface features which surround the Congo depression, and show why the main stream and its tributaries

are obstructed by falls. Account for the great volume of water that river carries to the sea.

7. Show how surface features presented an obstacle to the early exploration of Equatorial Africa, and how that exploration and the consequent development of the country have only been rendered possible by modern invention.
8. Show the effect of internal forces on the structure of Eastern Africa.
9. Draw a map showing the northern tributaries of the Congo and their connection with other river systems.

Climate.

Both the regions dealt with in this chapter lie athwart the equator, and therefore possess an essentially tropical climate, which, however, shows great variations due to differences in elevation. These variations will be shown by a comparison between the Orographical and the Temperature and Rainfall Maps. As no part of this region is far removed from the equator the range of temperature is slight, although the difference between day and night temperatures, especially on the plateau, is very marked. These differences cause European settlers to contract chills which often prove as fatal as the malarial fevers.

Turn to Maps 2, 3, 4, and 5 showing the January and July Temperatures, Pressures, and Rainfall. These show us that the migration of the sun's vertical rays north and south of the equator cause the region of greatest temperature and lowest pressure to shift north and south of the equator. Owing to this migration, the equatorial plain has two relatively wetter seasons. These occur when the sun is shining vertically, and this causes an increased evaporation and consequently increased precipitation.

Maps 4 and 5 show that the northern part of the Congo depression has a heavy rainfall throughout the year, and that south of the equator the rainfall increases in January. The western plateau rim occupied by French Equatorial Africa also falls within the belt of constant heavy rains.

The Congo Depression :—

The excessive moisture in this basin, coupled with the great heat, renders the region entirely unfit for permanent white habita-

tion. Consisting as it does of a low tableland only 2000 feet above sea-level, no part is above the malarial limit, and fevers are prevalent. There are two wet seasons in this region, from October to December and from February to May.

French Equatorial Africa. The Plateau North of the Congo Estuary :—

This falls within the zone of constant equatorial rains, which extends from the Niger coast to the Congo estuary. The rainfall diminishes considerably towards the south. The two relatively wetter periods are in December and May. During the latter month the heavy rains flood the rivers, particularly the Gabun. A cold current from the Antarctic regions modifies the temperature, but malarial fever prevails both along the seaboard and on the terraced edges of the plateau.

Portuguese Angola. The Plateau South of the Congo Estuary :—

There is a marked contrast in the climate of the northern and southern parts of this state. North of the Kwanza River the climate is similar to that of the Congo Basin, but its temperature is modified by land breezes blowing from the plateaux, or by sea breezes coming from the cool Benguela current which washes these shores. In this northern half the climate is hot and moist, and malarial fevers are prevalent along the coast. Even in Loanda, which has a slight rainfall, the moist atmosphere has an enervating effect. The Kwanza River forms the climatic boundary of this equatorial region, because south of it the conditions approximate to those of the Zambesi Plateau and South-West Africa. The temperature and rainfall decrease rapidly southward to the almost rainless districts of the Kunene River, while the dry climate of the plateau interior is favourable to European settlement.

The Plateau of the Great Lakes :—

The plateau rim presents a striking contrast in climate to that of the Congo depression which it surrounds. Permanent European settlement is impossible in the depression, but on the Tanganyika Uplands bordering the Western Rift and the Katanga Highlands the white man can live.

The coastal plain bordering its eastern edge has a hot, moist climate, and malarial fevers are prevalent south of Mombasa. North of it the plain is much drier and healthier, and the climatic conditions approximate more nearly to those of the Eastern Horn of Africa (*see* Chapter III.).

There is a marked contrast between the well-watered coastal plain south of Mombasa and the more arid conditions of the interior plateaux. The great heat of the interior causes a low-pressure region into which south-east monsoons blow for a great part of the year. These are rain-bearing winds, and the distribution of rainfall in the interior is determined by the position of the higher lands.

The lofty Usagura escarpment prevents rain-bearing winds from reaching the drier Ugogo Plateau. Similarly, the mountain masses of Kenia and Kilma Njaro, although well watered and covered with vegetation on their southern or windward slopes, cause the land north and west of them to be dry. The lower plateau edge between the Usagura and Livingstone Mountains allows the rain-bearing winds from the Indian Ocean to reach the higher lands of the Unyamwezi Plateau, which, due to its moister climate, is a very fertile region. The lower lands bordering Victoria Nyanza on either side of the equator resemble the Congo depression, and receive tropical rains, Uganda having two relatively wetter seasons, from October to December and from March to May.

EXERCISES.

1. Account for the great volume of the Congo River and its tributaries. Compare its position with that of the Amazon.
2. Explain the causes of the migration of the thermal equator and show its effect upon the climate, especially with regard to the rainfall of Equatorial Africa.
3. Show how far the surface features of Equatorial Africa form climatic boundaries. Give reasons for your answer.
4. Why is the temperature of the coastal plain south of the Congo estuary less than that of the coastal plain in similar latitudes on the east coast?
5. Describe the distribution of rainfall of Equatorial Africa east of the Western Rift. Point out any relation between it and the surface features.

6. Explain clearly why the prevalent wind of the Plateau of the Great Lakes is a south-east wind. What are the effects of this wind on the eastern edges of the plateau?
7. Explain why the vegetation and climatic conditions in French Equatorial Africa and the lands adjoining Victoria Nyanza are similar to those of the Congo Basin.

Flora.

The striking contrast already shown in the surface and climate of the Congo depression and the savannah lands of the plateau is also exhibited in the vegetation of these two regions. The coastal plain south of Mombasa is fringed with mangrove swamps and covered with thick forests, yielding *rubber*, *palm-oil*, and *copra* (which is the dried kernel obtained from the coco-nut palm). The steps to the plateau are covered with grass, but the wetter sides are clothed with masses of thick *bamboos*. On the plateau itself the vegetation varies with the rainfall, and valuable comparisons can be drawn between the distribution of the rainfall and the vegetation. Thick forests of trees alternate with rich pastoral and agricultural lands, while in some parts the arid climate and poor soil are responsible for a poor vegetation, approximating to desert conditions. The lower lands surrounding Victoria Nyanza and crossed by the equator are wetter, and tropical products are grown.

The northern part of the Congo depression, from the Lualaba confluence to the northern bend of the Welle River, is covered with dense forests which yield *teak*, *ebony*, *oil-palm*, *mahogany*, *rubber*, and *wild coffee*. These forests are so dense that the foliage shuts out the fierce rays of the sun, and the ground is covered with a thick undergrowth of creepers through which it is almost impossible to cut a path. In the southern part of the depression, where the temperature and rainfall are more moderate owing to the greater distance from the equator, the forests are not so dense, and large areas are cleared for agriculture. The plateau on the south has a lower temperature, and this, with a decreased rainfall, produces more open forests with large tracts of pasture land.

The plateau of French Equatorial Africa north of the Congo estuary falls within the zone of greatest rainfall, and hence is covered with equatorial forests.

South of the Congo mouth, the plateau of Portuguese Angola consists chiefly of savannah lands, with dense forests in the north, decreasing rapidly towards the more arid regions in the south.

The *Juba*, *Tana*, and *Sabaki* rivers draining the eastern edge of the plateau have rich alluvial valleys forming broad belts of well-wooded fertile lands, while the rich grass fringing the river banks forms excellent fodder.

Owing to the plateau formation of Eastern

regions are capable of greater development.

The Unyamwezi Plateau, having a fair amount of rainfall, consists of rich grass and agricultural lands and forests.

The lands bordering Victoria Nyanza are true savannah lands covered with grass or forests. On the south-west shores of the lake, and also bordering Lake Choga, are mud swamps covered with a papyrus jungle.

Between Victoria Nyanza and the Western Rift the surface consists of alternate

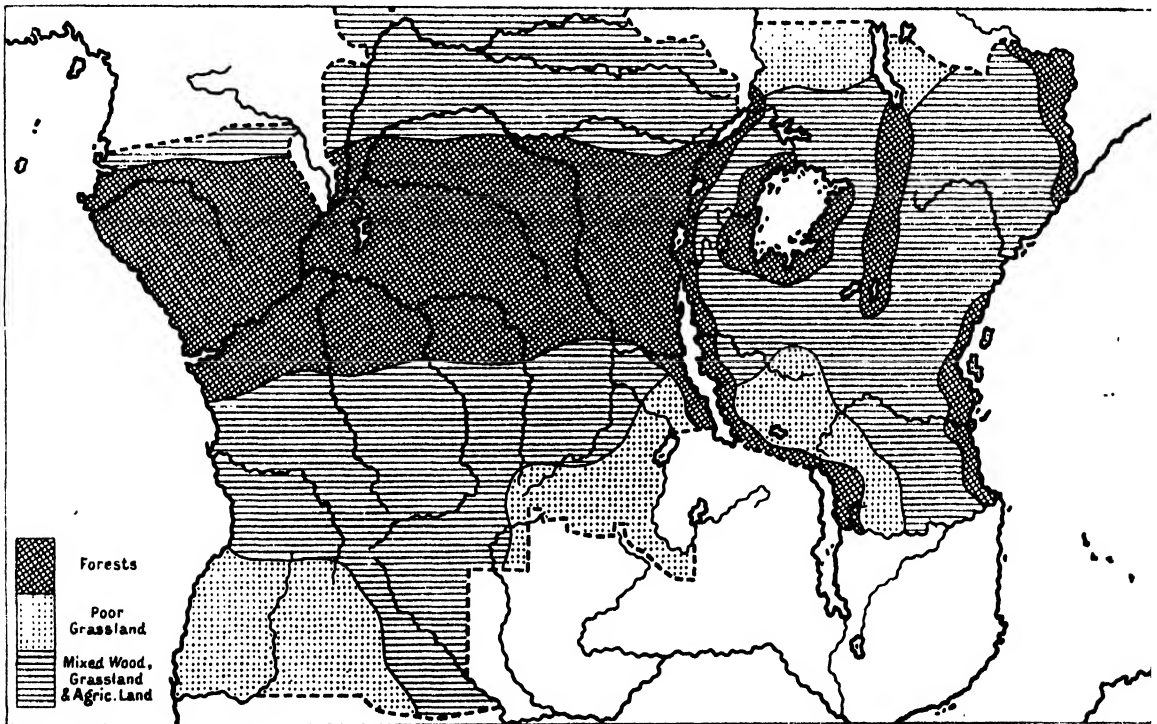


Fig. 5.—Vegetation of Equatorial Africa.

Africa most of the moisture is deposited on the windward slopes of the tableland, and this, coupled with the poor nature of the soil, creates in many parts desert conditions. The loftier escarpments of the rifts and the windward slopes of Kilima Njaro and Kenia are clothed with forests, and there are different zones of vegetation on these slopes due to differences in elevation. The *tsetse fly*, a great pest on the plateau, is almost absent from these higher lands, and therefore flocks of *sheep*, *cattle*, and *goats* can be reared. As the climate is suitable for Europeans, and *cereals* can be grown, these more elevated

hills and depressions. The former are grass lands capable of agriculture, where European life is possible; the latter are covered with forests and unhealthy swamps. This land rises to the Ruwenzori Mountains, whose sides are clothed with vegetation arranged in zones due to elevation.

The slopes of the Western Rift are clothed with forests, especially in the area drained by the Semliki River.

The forest area of the Congo depression, equal to that of France and the Spanish Peninsula combined, is crowded with giant trees, often 150 to 200 feet high.

The dense foliage of these shuts out any view of the sun or sky. Circling round the trunks and forming loops and festoons connecting one tree with another are innumerable creepers, some of which are 2 feet in diameter. The ground is covered with a mass of vegetation, and orchids abound.

Products of Commercial Value :—

Equatorial Africa at present yields little to commerce. The want of settled government, the malarial climate, the scarcity of good communications, and the difficulties in the navigation of the rivers are obstacles which will have to be overcome before this area can be fully developed. Even then, the poor soil in many parts of the Congo Basin and in Eastern Africa must cause these areas to be permanently barren. European Powers, especially Germany and Britain, are doing much to develop and extend the products of the interior. Plantations of *coffee* on the lower slopes of the plateau, *Ceara rubber* in the coastal plains, and *cotton* in the Juba valley and in British Uganda have increased the export of these products largely. As railways are carried inland and communication with the coast is thus made possible, there is no reason why the higher lands of the Eastern Plateau and those bordering the Congo Basin, which are well watered and free from the tsetse fly, should not be made to grow European products, and their grassy plains to support herds of *cattle*, *sheep*, and *goats*.

The forests of the *Eastern Coastal Plain* and the adjacent islands of *Zanzibar*, *Pemba*, and *Mafia* yield *rubber*, *timber*, *copra*, and *copal*. *Rice*, *maize*, *cassava*, and *sugar* are grown by the natives, while *rubber*, *tobacco*, *vanilla*, *cotton* and *coffee* plantations are now increasing. *Zanzibar* and *Pemba* export *cloves* and *spices*, and these islands could be developed to produce *coffee*, *sago*, *vanilla*, and products similar to those of the coastal plain.

The forests of the *Eastern Plateau* yield valuable woods. The chief forest areas are those of *Kilima Njaro*, *Kenia*, the *Aberdare Mountains*, *Mau Forest*, and the *Ruwenzori Mountains*. On the higher slopes above the forest level are *bamboo* jungles, the product of which is exported.

The *Uyamwezi Plateau* is a fertile area capable of growing *grains* and *fruits*.

In *British Uganda* the area devoted to *cotton* growing is rapidly increasing, and *sugar*, *spices*, *coffee*, *arrowroot*, and *cocoa* are also grown. The *banana* is the staple food of the natives who live in the lands bordering *Victoria Nyanza*. The leaves of the plant supply thatch for their huts, the fibre obtained from it is made into ropes, and from the sap a kind of soap is obtained.

The forests of the *Congo Depression* yield *rubber*, *palm-oil*, *palm-nuts*, and *white copal*. The limits of the oil-palm appear to be defined by the boundaries of this basin, for both on the *Congo-Zambesi* and the *Congo-Nile* water-partings it refuses to flourish. *Tobacco* is grown in all the native villages, where the inhabitants also grow *maize*, *manioc*, *millet*, *hemp*, and the *sugar-cane*. Plantations of *rubber* and *coffee* have been established by the Belgian Government. The higher lands surrounding this basin are capable of growing equatorial products.

The forests both *north* and *south* of the *Congo estuary* yield *rubber* and *timber*, but the rubber in Portuguese territory is being rapidly exhausted. The French Government is encouraging the growth of *coffee*, *vanilla*, and *cocoa* in their territory north of the estuary. *Coffee* is an important product on the plateau of *Angola*, and a railway has been carried from *St. Paul de Loanda* to the coffee plantations of *Ambaca*. The *cotton* fields which once flourished are now being neglected. *Tobacco* is grown for local consumption, and *sugar*, used in the rum distilleries, is important.

Fauna.

The *savannah lands* of the *Eastern Plateau* are the haunt of numerous wild animals, and hence *Uganda* is a favourite resort of big game hunters. The grass lands of the plateau provide food for herds of *antelopes*, *buffaloes*, and other *ruminants*, while the clumps of trees provide cover for carnivorous animals, such as the *lion* and *leopard*. *Rhinoceros*, *hippopotami*, and *crocodiles* are prevalent in the river valleys. *Elephants*, which were once plentiful, are now scarce, owing to the depredations of Arab traders anxious to obtain ivory. *Pelicans* and *flamingoes* abound in the swampy regions of *Victoria Nyanza* and *Lake Rukwa*. Reptiles are represented by the *python*, *cobra*, and *puff-adder*.

Large areas of grass land cannot support domestic cattle owing to the ravages of the *tsetse fly*. The same cause makes it impossible for beasts of burden to carry goods into the interior, and human porters have to be employed. This insect is responsible for the non-success attending the introduction of European domestic animals. The *white ant* is also a common plague of this district, and sometimes whole areas are devastated by swarms of *locusts*.

In the densely forested areas of the *Congo Basin* many of the larger animals cannot live because of the undergrowth, but these forests are the home of man-like *apes*, large *reptiles*, and numerous *insects*. The *gorilla* inhabits the forests of the Ogowe Basin of the French Congo. In the less dense forests *elephants*, *leopards*, *buffaloes*, and *wild cattle* are plentiful, and ivory is still an important article of export. The introduction of European domestic animals has met with the same result as on the Eastern Plateau owing to the *tsetse fly*.

The *Plateau of Portuguese Angola* is the home of *buffaloes*, *zebras*, *antelopes*, and *gazelles*. The *elephant* has disappeared from this region, but large beasts, such as *lions*, *leopards*, *panthers*, and *hyenas*, inhabit the plain. *Crocodiles* and *hippopotami* are prevalent, especially in the Kunene Valley.

Minerals.

The mineral wealth of Equatorial Africa remains at present undeveloped. *Iron ore* appears to be universal, abundant supplies being found in some of the provinces of Uganda. *Copper* is mined in considerable quantities in the Katanga district of the southern part of the Congo Basin, and this mineral is also found in the central province of Uganda. *Silver* and *lead* are found in small quantities near Mombasa. *Gold* in small unworkable quantities is found in British East Africa, Uganda, Portuguese Angola and the French Congo. *Alum*, *graphite*, *coal shale*, and *mica* are found on the Eastern Plateau, while *volcanic minerals*, *graphite* and *marble*, are found in the volcanic areas, and *opals* in the Eastern Rift. Small quantities of *copper* and *iron* are obtained from the Western Plateaux, while *petroleum* is obtained from Portuguese Angola.

To tap the rich resources of the Katanga district, the railway from Cape Town to the Victoria Falls *via* Bulawayo has been continued northward to Elizabethville.

The natives of the Eastern Plateau are skilful workers in iron, and forge spear heads from it, as also are the workers in the Congo Basin who make hoes, spades and other agricultural implements in addition to hand-wrought copper articles.

The lack of coal is a great drawback to any development of the mineral wealth of this region.

EXERCISES.

1. By comparing Fig. 5 with the Rainfall Maps 4 and 5, show how the vegetation of this region is largely dependent upon the climate.
2. Name the areas of Equatorial Africa which are suitable for European habitation, and show how development of the country by Europeans might increase the value of this region.
3. Why have these regions remained so long undeveloped? Show in what ways modern invention was necessary to the development of this region.
4. East Africa is the resort of the big game hunter. Name the chief wild animals of this region and the localities where they are found.
5. What was the chief object of Arab trade into the interior? Why were caravans of human porters necessary to carry the material to the coast?
6. Name the chief products of the Congo Basin. What obstacles prevent the full development of these products?
7. Which parts of Equatorial Africa grow coffee, cotton, cocoa, and sugar? State the climatic or soil conditions upon which the growth of each of these products depend.
8. Name the chief minerals found in this region. Explain why there is little probability of this area ever becoming a busy mining or manufacturing district.

Routes.

The future development of this, as other regions of Africa, depends upon the construction of railways into the interior. The progress of this development has been retarded by the natural obstacles to access. Continuous river navigation is impossible on

any river because of the waterfalls. The unhealthy coastal plain and the dense impenetrable forests are obstacles almost as serious, while the ravages of the tsetse fly make animal transport impossible. Under these circumstances it is easy to realise why the Arab and Hindu traders, who for years occupied the chief ports on the east coast, obtained the ivory from the plateau interior by means of caravans of slaves. Hence many of the routes into the interior are the mere beaten tracks of these human porters. Although the slave trade has been abolished, yet a large proportion of the internal trade is still done by porters, who exchange the textile and other manufactured goods of Europe and America for the raw products of these equatorial lands. This method of transport is necessarily very slow, and the cost is enormous, even carriage by rail, expensive though it is owing to difficulties in construction, proving the cheaper in the end.

Railways:—

Of the railways in Equatorial Africa the longest is the Uganda Railway, which reaches from *Mombasa* on the coast to *Port Florence* on Victoria Nyanza. If you place the loose Surface Map of this region under the Transparent Route Map, you will see the natural obstacles this railway has to overcome.

The cost of construction of the Uganda Railway has been very great, owing to the gradients necessary in crossing the Eastern Rift. This rift lies between the two stations Mau Summit and Kikuyu. *Nairobi* on the more healthy plateau is the chief centre of the railway works.

In German East Africa there is a railway from *Dar-es-Salam* to *Mrogoro*, and this is being carried farther inland, while another railway from *Tanga* runs inland to *Kurogwe*, with a farther extension to *Buiko* in the Pangani valley.

Notice in the Congo Basin the 250 miles of railway which have been constructed between *Matadi* and *Leopoldville* to avoid the Livingstone Falls. The future of the Congo Region depended upon linking the navigation on either side of these falls. River navigation is possible, and proves the best means of communication in the greater part of this basin, and this railway, by connecting the huge navigable waterways of the interior

with those of the estuary, enables the products of this region to be exported. The copper mines in the south of the Congo Basin have caused the main line of railway from *Cape Town* and *Bulawayo* to be carried to *Elizabethville*. Notice on the map the short line of railway from *Stanleyville* to *Ponthierville*, to connect the navigation on either side of the Stanley Falls.

In Portuguese Angola there is a railway from *St. Paul de Loanda* to the coffee plantations of *Ambaca*, and this has now been extended to *Kasange* and *Malanje*, another connects *Benguela* with *Bihe*, and a third runs inland from *Mossamedes*.

The railway from Cape Town to Bulawayo has been carried across the Zambesi just below the Victoria Falls, and across the Kafue River to Elizabethville. This railway is being extended to the *Lualaba*, from which it will probably be taken through the Western Rift to eventually join the route which is being carried southward from *Cairo*. A route is also projected to link this to the line from *Benguela* which has been constructed to *Bihe*. Other projected lines in the Congo Basin are an extension of the railway from *Ponthierville* and another from *Stanleyville* to Wadelai, north of Lake Albert, to link the Congo system with the Cape to Cairo route.

River Navigation:—

This is an important means of communication, and has been increased in value by the construction of railways to avoid the falls. The Congo estuary is navigable for 100 miles to *Matadi*, and there is a regular service of eleven steamers on this route, while large ocean steamers can reach *Boma* and smaller ones ascend to *Vivi*. The Middle Congo has 1200 miles of navigable waterway in addition to that of its tributaries, and on this thirty-seven steamers maintain a regular service between *Stanleyville* and *Leopoldville*. In consequence of this the chief towns of the Congo Basin are the route centres on the river.

Brazzaville in the French Congo, *Leopoldville*, *Coquilhatville*, and *Stanleyville* are the chief collecting centres on the Congo, while *Luluaberg* is the chief route town of the Kasai River system.

Steamers also navigate Victoria Nyanza. The route map shows that steamers call at

Port Florence, Mwanza, Bukoba and Entebbe. From the latter place there is road communication to the navigable course of the Middle Nile. This makes possible a through communication by rail, lake, road and river between *Mombasa, Khartum, and Cairo.* This route is being used largely by tourists and big game hunters.

British steamers also navigate the Upper Nile and Lake Albert, and also Lake Nyasa in the south of this region, while German steamers navigate the lakes in their territory.

The lower courses of the rivers which drain both the eastern and western plateaux have a navigable section where they flow across the coastal plain.

Caravan Routes :—

These, although superseded in parts by rail and water communication, must still be important, especially in these parts where railways have not been constructed. The map shows important caravan routes through German East Africa from *Bagamoyo* and *Dar-es-Salam* to *Ujiji*, through *Taborah*, the chief centre of the fertile region of Unyamwezi, and also connections from this route to *Mwanza* at the southern end of Victoria Nyanza. Important routes also lead from the ports of French Equatorial Africa *via* the Ubangi River to the French possessions around Lake Tchad.

Zanzibar, which for years was the capital of the Arab kingdom, became the chief market for slaves, and later these same people, inured to the climate of this region, were used by Stanley and others in their explorations into the interior.

The main routes into the forests must, owing to the dense undergrowth, be the great waterways, as the land routes are often mere tracks obliterated by the growth of creepers.

Commerce.

Until the latter part of the nineteenth century the trade along the *East African seaboard* was controlled by Arab and Hindu traders, intent on obtaining slaves and ivory from the interior. They established ports at the best harbours, and from these, routes, often mere beaten tracks, led to the interior. Later, Portuguese sailors made settlements along the coast, but these, especially in the

north, were not successful, and the greater part of the trade of this region was controlled by the Sultan of Zanzibar, who, from the capital of the island of the same name, exerted influence over a large area of the adjacent mainland extending from Cape Guardafui to Cape Delgado. In the latter part of the nineteenth century Britain and Germany obtained control of this coast and the interior plateau, and since European development of this region many steamships call at the chief ports, while there is a regular coast service between one harbour and another. The chief exports of this region at present are *rubber, ivory, copra, hides, grain, and hemp*, but, with the development of the plantations, probably the export of *cotton, tobacco, and coffee* will increase. The through connection between the East Coast and the Nile may also increase the trade of this coast. The chief ports along this coast are situated where there are breaks in the coral formation. The most important harbours controlled by Britain are *Mombasa* and *Zanzibar*, while *Dar-es-Salam, Tanga* and *Bagamoyo* are the chief ports of the German territory.

Ports and Chief Towns of British East Africa :—

Mombasa, situated on a coral islet, was an important port of both the Arabs and the Portuguese. The harbour on the east side of the island is the terminus of the Uganda Railway, and is connected with the mainland by a massive iron bridge. Regular lines of steamships call here, and the port has a monthly mail service with Britain.

Melinde, at the mouth of the Sabaki, is of lesser importance, but was a noted Arab station.

Kau and *Witu*, on the Tana delta, were also Arab stations. The latter town is noted for its *rubber* export.

Kismayu, at the mouth of the Juba River, is a modern town which is increasing in importance.

Zanzibar.—The town lies on the west side of the island and is one of the largest seaports on the East African coast. The chief exports are *cloves, spices* and *coco-nut* products, but these have decreased since the abolition of the slave trade. As this part is almost equidistant from Cape Town, Suez, and the southern extremity of India, its position will make it one of the most important harbours of the world.

Pemba.—The harbour of this island is on the east coast, and like Zanzibar exports the *cloves, spices* and *coco-nut* products of the interior.

The chief inland trade centres are :—

Nairobi, on the plateau, is the seat of government and the headquarters of the Uganda railways.

Entebbe, on Victoria Nyanza, is the terminus of a road route to Gondokoro, and in steamship communication with Port Florence.

Port Florence, on an easterly arm of Victoria Nyanza, is the terminus of the Uganda Railway.

Ports and Chief Towns of German East Africa :—

Dar-es-Salam has one of the best harbours along this coast. The town contains the governor's residence, and is the coast terminus of many caravan routes and a railway.

Tanga, north of the Pangani mouth, is the terminus of a railway into the interior.

Bagamoyo, opposite to Zanzibar, was of very great importance, as caravan routes led from it to Ujiji on Lake Tanganyika and to Mwansa on Victoria Nyanza. It is decreasing in importance owing to the competition of railways from Dar-es-Salam and Tanga.

Mafia.—This coral islet, covered with coco-nut palms, has a poor harbour, not accessible at low tides for boats.

The chief inland trade centres are :—

Taborah, on the main caravan route to Ujiji, is the centre of the fertile Unyamwezi Region.

Ujiji, on Lake Tanganyika, was formerly an Arab slave and ivory depot. Its great drawback is its low elevation, which causes it to possess a malarial climate.

Commerce of the Congo Basin and the Western Seaboard.

Although the Portuguese had in the sixteenth century established settlements along this coast, the trade of this region did not develop until the latter half of the nineteenth century. After Stanley's discoveries in the Congo, Arab traders pushed inland from the east coast to Nyangwe in search of slaves and ivory, but until railway construction had overcome the obstacles to river navigation,

the interior could not be fully developed. Even now the shifting nature of the river channels and the silting up of many of them, added to the malarial climate, are obstacles which prevent rapid development.

The impossibility of white habitation in many parts, and the difficulty of obtaining native labour to collect the rubber, caused the Belgians to use methods of compulsion which were abhorrent to European nations, and their expressed disapproval has caused the Belgians to use more humane methods with the natives (*see* Government and History).

The chief exports of the Congo State are *rubber, ivory, palm-oil* and *nuts*, and *copal*. *Tobacco, cocoa*, and *coffee* are also grown, and the government is establishing rubber and coffee plantations. The chief *imports* are manufactured goods, especially those in *cotton*, which are largely imported from the British Isles. The chief seaports are *Banana* and *Boma* on the estuary, and they trade with Antwerp, Liverpool, Rotterdam, Hamburg, and Bordeaux. The inland centres are the river ports already mentioned (*see* Routes). *Matadi* owes its importance to the railway.

The products of French Equatorial Africa are similar to those of the Congo Basin, and *rubber, timber*, and *palm-oil* are the chief exports, while *coffee* and *cocoa* are an increasing product. The chief ports are *Loango* and *Libreville*. Inland the chief centre of population is *Brazzaville* on Stanley Pool, which is the capital of the Middle Congo Colony. The other towns are collecting stations on the route which leads northward *via* the Ubangi to the Lake Tchad Basin and the Sudan.

Libreville, the capital of the Gabun Colony, is situated at the mouth of the Gabun River. It was once a refuge for rescued slaves, hence its name.

Portuguese Angola was settled in the sixteenth century, but, owing to bad government, little progress has been made in commerce. The chief exports of this state are *coffee* and *rubber*, while plantations yield *sugar (rum distilleries), tobacco*, and *cotton*. The cotton plantations are now neglected. The chief ports are *St. Paul de Loanda, Benguela*, and *Mossamedes*, while in the small Portuguese territory north of the estuary are the ports of *Cabinda* and *Landana*.

St. Paul de Loanda, the capital, has the best harbour on this coast. It is the coast terminus of the railway from *Ambaca*, and small steamers navigate the *Kwanza* to *Dondo*. Its chief export is *coffee*.

Mossamedes, at the mouth of the Cunene, exports *cattle*, *nitrates*, and *fish*. It is the port of the drier southern regions.

Benguela is the coast terminus of the railway to the Bihe Plateau, and exports *coffee* and *rubber*.

Cabinda and *Landana* export much of the produce of the Congo Basin.

6. State the position of the following ports, and name the regions of which they form an outlet: Boma, Mombasa, Bagamoyo, Loanda, and Libreville.

7. Name the most important centres of the Congo Basin, and show how position has made each important.

Peoples.

The *Bantu* races are the chief occupants of Equatorial Africa. The differences both in the physical and intellectual powers of the

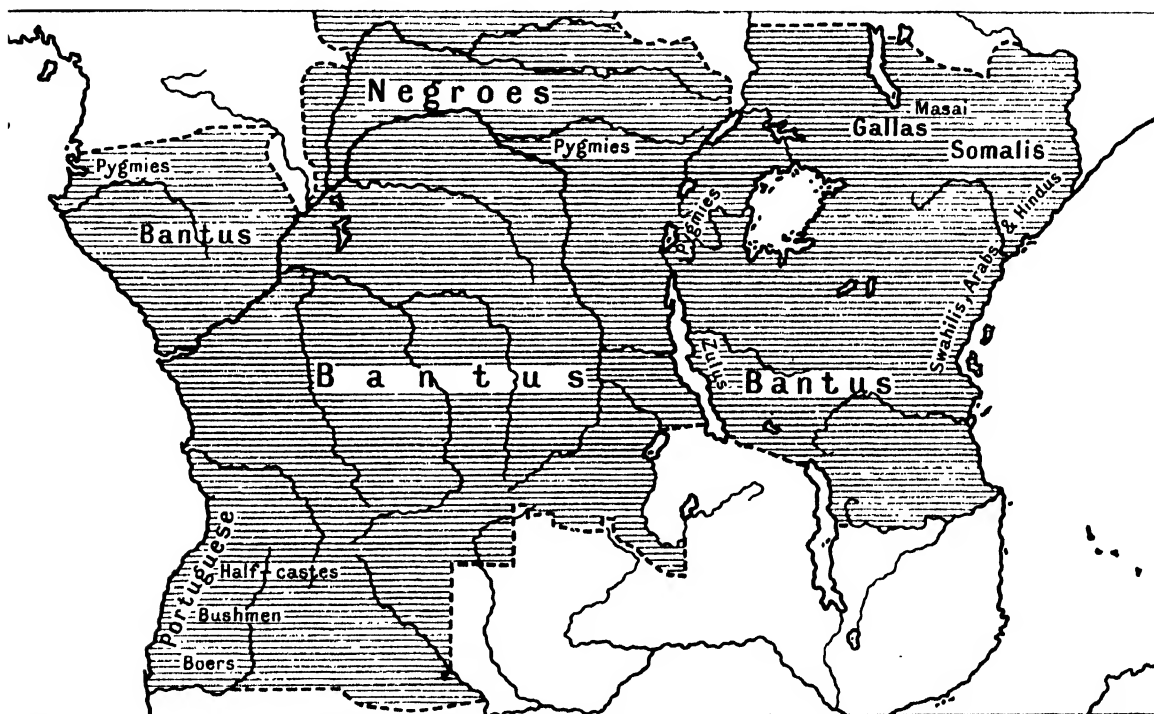


Fig. 6.—Peoples of Equatorial Africa.

EXERCISES.

1. Describe the natural features crossed by the Uganda Railway. What future railway development may increase its importance?
2. Show that the railway from Matadi to Leopoldville was an essential to the development of the Congo Basin.
3. Why are railways not so necessary in the Congo Basin as in other parts of Africa?
4. Show how natural features facilitate the linking up of the communications of this region with adjoining regions.
5. Describe the exact position of Zanzibar, and show how that position will always make it important.

C—AFRICA, SEN.

various tribes are most marked. In some parts the inhabitants are good farmers and clever workers in metal, and present a sharp contrast to the degraded cannibals of other regions. In spite of these great differences all the languages are closely allied, and this accounts for the ease with which all acquire the *Swahili* language as spoken by the mixed *Arab* and *Bantu* peoples of the Eastern Coastal Plain. Distinct from the Bantu tribes are the *pygmies* found in the Ruwenzori Mountains, in the Aruwimi forests, and in the Gabun Basin. These are a most depraved people, both physically and mentally very backward. The stunted race of

people found in Southern Angola are probably descendants of the *Bushmen* who now inhabit the Kalahari Desert farther south.

The Arab invasion along the coast, and the inclusion of the whole of the Eastern Plateau under the Arab Sultan of Zanzibar's dominions, have had a marked influence on the Bantu peoples. Along the eastern plain, Arabs have intermarried with the Bantu races, and the Swahili peoples are chiefly half castes. Arab traders are also found at most of the chief centres on the Eastern Plateau, and after Stanley's discovery of the Congo they pushed into the Congo Basin from the east to Nyangwe and other stations. Here they offered considerable opposition to the early civilising influences of the Belgian Government.

The Zongo Falls, on the Ubangi tributary of the Congo, mark the boundary of the Bantu races. North of that the people belong to the *Negro* type, and have darker complexions and curly hair.

The *Hindus*, who settled on the Eastern Coastal Plain, have exerted less influence on its peoples than the Arabs, having kept aloof from the natives except for purposes of trade. During the latter half of last, and during the present, century, *European influence* has dominated this region. White races have settled for purposes of trade, and although the lower lands are unsuitable for white settlement, yet, in the future, Europeans may be attracted to the fertile areas of the higher plateaux.

The Swahili peoples of the coastal plain, able to withstand the evils of the climate, were hired by Stanley and other explorers as porters on their expeditions to the interior.

In Portuguese Angola many of the Bantus are highly civilised, while a large proportion consist of half-castes, the pure Portuguese being limited almost to the officials. In the south live a number of *Boers*, who trekked northward from South Africa. Most of these returned to Cape Town, but a number settled in this State.

Zulus from the south invaded the Eastern Plateau, and are still found in many parts. Along the shores of Lake Tanganyika they live side by side with the native Bantus, who here are more closely related to the white races, owing to the migrations southward of people from Gallaland.

History.

The *Eastern Plateau* and the coastal plains came in very early ages under the influence of Arab and Hindu traders. The former established a powerful empire, which extended along the greater part of the east coast, but this was broken up by the arrival of the Portuguese in the fifteenth century. These latter established trading settlements along the coast, but their hold over the interior was very slight, and with the downfall of their empire in India these settlements were allowed to fall into decay. On the ruins of these the Arabs built up a second kingdom, extending from Cape Guardafui to Cape Delgado, and governed from the island of Zanzibar. Thus in the latter part of the nineteenth century, when German and British influence began to assert itself in this region, the whole plateau formed a vast protectorate controlled by the Sultan of Zanzibar, the chief object of its rulers being to obtain slaves and ivory from the interior.

The British Government made no attempt to annex land in this region, and even refused the offer of a protectorate over the Sultan's dominions, until Germany in 1884 obtained a foothold on the coast opposite Zanzibar. Britain then occupied Mombasa, and claimed a protectorate over the Sultan's dominions, at the same time granting a charter to the *British East Africa Company* to develop the interior. This Company did much work in Uganda, but finding its expenses too heavy, handed the administration back to the Home Government. Two Anglo-German agreements, one in 1886 and another in 1890, defined the boundaries of *British and German territories*, while in 1890 the islands of Zanzibar and Pemba, the remnant of this large empire, became a British protectorate.

The history of the *Congo State* and the western plateaux is much more recent, that of the Congo State dating back to 1876, when Stanley first discovered the upper courses of the river. An association, controlled and financed by King Leopold of Belgium, was formed with the object of exploring and developing the interior. This association financed Stanley's second expedition to the Congo Basin in 1879, when he started from the mouth of the river and worked his

way into the interior. For five years (1879-1884) Stanley explored large areas, and by peaceful means made many treaties with the African chiefs, and in 1885, after Stanley's return, this association sought to secure the recognition of the European Powers. Thus was formed the *Congo Free State*, with the two-fold object of developing the products of the interior for the benefit of the commercial world, and raising the standard of civilization of the African native. The latter object the State has altogether failed to achieve. The desire to obtain large supplies of rubber caused the officials of King Leopold of Belgium to use brutal means of compulsion with the natives, which further degraded the Bantu peoples. These methods earned the disapproval of all the European Powers, and their protests caused the State to be removed from the control of the King of Belgium to that of the Belgian Parliament in 1907. Since then the treatment of the natives has improved.

The history of *French Equatorial Africa* is also of recent date. Portuguese names, such as Lopez, indicate that early Portuguese settlers landed on this coast, but these made no attempt to penetrate the interior. The first French settlement took place in 1841, and from that time till the close of the nineteenth century numerous explorations were made into the interior. Those of Crampel, Marchand, and others, extended this territory northward to the Lake Tchad Basin. The limits of French territory have been determined by many international conventions, by the last of which, in November 1911, France ceded to Germany part of her territory (see Political Map) in exchange for German recognition of the French protectorate over Morocco (see Chapter V.).

Portuguese Angola was discovered by Portuguese explorers in the fifteenth century, and these made several coast settlements. Although Catholic missionaries penetrated inland for some distance, and caravans made journeys into the interior for ivory, slaves, and coffee, the Portuguese Government did not encourage exploration. During recent years it has been more active in surveys of the interior.

Political Divisions.

British East Africa consists of the northern half of the Eastern Plateau (which is divided

into the *East African and Uganda Protectorates*, both controlled by the Colonial Office), and the islands of Zanzibar and Pemba, still governed by the Arab Sultan, but under the control of the British Foreign Office. The density of population is about twenty persons to the square mile, the greater proportion of whom are Bantus, but there are about 2000 Europeans and 25,000 Asiatics.

The East African Protectorate extends from the Juba River in the north to the Umba estuary in the south, and inland to the borders of Uganda. The colony is under the control of a Governor assisted by an executive and legislative council. For purposes of administration the State is divided into seven provinces, each under a Commissioner. *Nairobi*, the capital, has a population of 14,000, but *Mombasa*, on the coast, with a population of 30,000, is the largest town.

Uganda was administered by the British East Africa Company until 1894. It lies between 5° N. latitude and 1° S. latitude, and is bordered on the west by the Belgian Congo State. Notice on the map that this area includes parts of Victoria Nyanza and Lake Rudolf, and the upper course of the Nile to Lado. Most of the territory is directly controlled by British administration, but native chiefs are assisted in governing their own peoples. The whole protectorate is under the control of a Governor, and the State is divided into five provinces for purposes of administration.

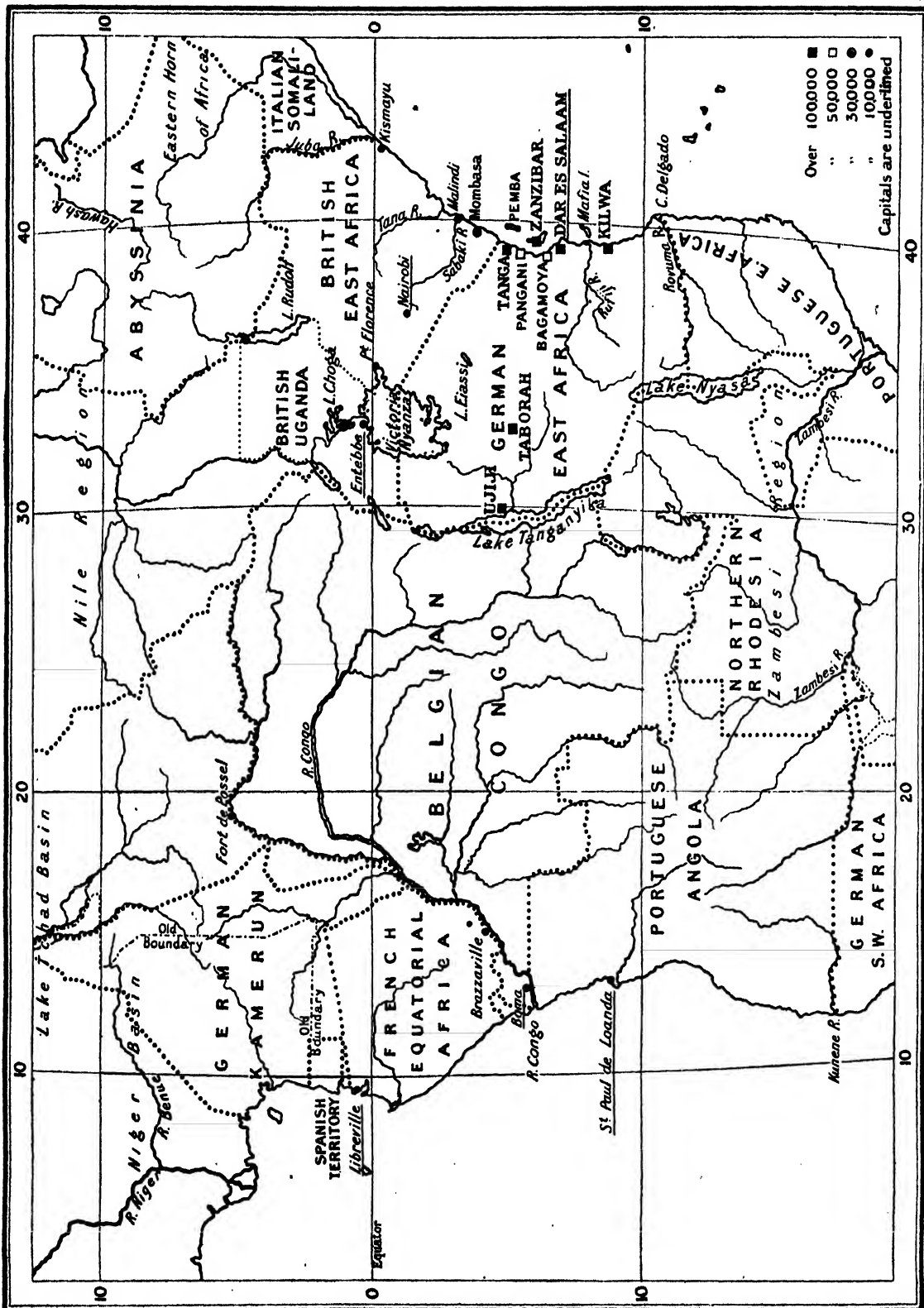
Zanzibar, with a population of 114,000, and *Pemba*, with 83,000, are inhabited chiefly by Arabs (who are the landlords and employers of labour) and Swahilis. The town of Zanzibar has a population of 35,000.

German East Africa extends from the Umba estuary southward to Cape Delgado and the Rovuma River. It has a coast-line of 620 miles, while the interior lands stretch to the Western Rift, where they meet those of the Belgian Congo State. The population, numbering over 10,000,000, are chiefly Bantus.

The German Emperor is represented by an Imperial Governor, and the state is divided into nine communes for purposes of administration.

There are several thickly peopled towns in this state. Notice on the map *Taborah*,

CENTRAL AFRICA—POLITICAL.



with a population of 500,000, *Dar-es-Salam* (the capital), 195,000, *Ujiji*, 175,000, and *Tanga* and *Bagamoyo*, each with 77,000.

The *Belgian Congo* is now controlled by a Colonial Council nominated by the King and the Belgian Parliament. Locally the country is under the control of a Governor assisted by Vice-Governors. The population is estimated at 15,000,000, an average density of sixteen people to the square mile. Of these the European element numbers only 3000. The capital of the state is *Boma*.

Notice that the boundaries of the Congo State follow for the most part the natural features. In the north and west the Ubangi River separates it from French territory. In the east the boundary follows the Western Rift, and cuts through Lakes Albert, Edward, Kivu, and Tanganyika. The boundary on the south roughly follows that of the Congo-Zambesi water-parting, while for part of its course the Kwanza separates this state from Portuguese Angola on the west.

French Equatorial Africa extends from the German Kamerun colony in the north to the Congo estuary in the south, with the exception of the small *Spanish coastal province of Rio-Muni* in the north, and the *Portuguese Cabinda Province* in the south. Map 11 shows that it formerly reached to the Congo and its tributary the Ubangi, and stretched northward to the Nile Basin and Lake Tchad. Notice on the map the new boundary and the part ceded to Germany by the treaty of November 1911.

The area of French Equatorial Africa is 600,000 square miles, and contains a population of 10,000,000. It is divided into three colonies for purposes of government—the *Gabun Colony* (capital, *Libreville*), the *Middle Congo Colony*

(capital, *Brazzaville*), and the *Ubangi-Shari-Tchad Colonies* (capital, *Fort de Posselt*).

Portuguese Angola has a coast-line of 1000 miles and extends southward from the Congo estuary to German South-West Africa. Notice on the map the small *Cabinda territory* north of the Congo estuary. The capital of this state is *St. Paul de Loanda*, containing the residence of the Governor-General appointed by the Portuguese Republic.

The Portuguese administration on the plateau is still very slight, the power being in the hands of native chiefs. On the coast lands the government is poor, and although slavery was abolished in 1878 slaves are still sent to work in the cocoa plantations of St. Thomas and Prince's Islands, while the labour conditions for the natives who remain are little better than those of slavery.

EXERCISES.

1. Show the effect of the Arab invasion on the peoples and trade of Eastern Equatorial Africa.
2. Name the chief early Portuguese settlements in this region. What was the main object of many of these settlements, and when did many of them fall into decay?
3. Give the history of the formation of the Congo Free State. Why was the administration of this state placed under the control of the Belgian Government?
4. Name those boundaries in Equatorial Africa which follow natural features.
5. Name those parts of Equatorial Africa which are governed by native chiefs under the protection of a European Power.
6. In what parts of Equatorial Africa are Pygmies, Bushmen, Boers, and Zulus found? Account for their presence in these areas.

AFRICA.

CHAPTER III.

THE NILE BASIN—ABYSSINIA AND THE EASTERN HORN OF AFRICA.

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Surface and Drainage: The Plateaux of
Abyssinia and the Eastern Horn of
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The Nile and its Irrigation.
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Position.

Notice on Map 12 that the River Nile forms the connecting link between Tropical and Mediterranean Africa, and that the greater part of this region is occupied by its basin. To the east lies the *Abyssinian Plateau* which, being drained to the Nile, forms part of the basin of that river. The *Eastern Horn of Africa*, allied in structure to Abyssinia, is included in this region, and terminates in *Cape Guardafui* and the island of *Socotra*.

This area, which might also be called North-Eastern Africa, politically includes *Anglo-Egyptian Sudan*, occupying the land on either side of the Middle Nile from the edge of the Eastern Plateau to Halfa; *Egypt Proper*, extending from this boundary to the Mediterranean coast; the independent kingdom of *Abyssinia*, occupying the plateau east of the river; the Italian province of *Eritrea*, bordering the shores of the Red Sea; the small French province of *Obock*, opposite to Aden; and the states of *British and Italian Somaliland*, which occupy the Eastern Horn of Africa.

This region is linked to the Eastern Plateau because of the drainage of the great lakes to the Nile, but its boundaries are clearly defined on the north and east by the sea, and on the west by the desert. In the far south-west the *Bahr-el Ghazel* tributaries approach those of *Lake Tchad* and the *Congo Basins*.

Seas and Coasts.

The Mediterranean.—This region, bordered on the north by the Mediterranean Sea, has a sandy coast from which precipitous cliffs rise to the desert plateau of the interior. This coast terminates at *Alexandria*, where 150 miles of deltaic shores stretch to *Port Said*. The chief feature of this coast is the chain of shallow lagoons which border the sea. These are fed chiefly by the Nile and occasionally, when the river is low, by the sea. With the Nile water they receive a large quantity of river sediment and thus prevent that rapid development of the delta seaward, which is the case with the Ganges and other deltas. Many of these lakes are now silted up, and pro-

THE NILE BASIN AND ABYSSINIA.

Map 12.



Natural Scale, 1 25 000,000, or 395 miles to the inch

bably at some future date they will all disappear and then the river will extend its delta outward.

The *Red Sea* coast has a very regular outline with no indentations or natural harbours, while the coral formation which fringes its shores presents a dangerous obstacle to navigation. As no perennial streams enter this sea, much more water is lost by evaporation than drains to it. Hence the water is extremely saline and only keeps its level by means of a strong surface current which flows from the *Gulf of Aden* through the *Strait of Babel-Mandeb*. The northern half of both shores borders desert, and the southern parts of both are rendered inaccessible by the steep brink edges of the plateaux on either side, hence there is little trade across it. In early days, however, the Red Sea formed the highway for trade with the east, and caravan routes crossed the narrow land belt between this sea and the Mediterranean. In modern times the cutting of the *Suez Canal* has increased this trade enormously. Valuable *pearl fisheries* exist off the coast of *Eritrea*, giving an annual yield of £30,000.

The Gulf of Aden.—The coasts bordering the Gulf of Aden are also sandy, and except for *Tajurah Bay*, upon which is the French port of *Jibuti* and the haven at the British port of *Berbera*, the shores are inhospitable. The barren rocks known as the *Brothers*, off *Cape Guardafui*, are connecting links between the structure of the mainland and the island of *Socotra*.

The Isthmus of Suez and the Suez Canal.

This isthmus occupies a depression between the Mediterranean and Red Seas and contains many lakes, chief of which are *Lake Timsah* and the *Bitter Lakes*. Some of these drain northward to the Mediterranean, while others are connected with the Red Sea, and between these two systems is a low plateau.

Across this isthmus, and connecting the lakes in the depression, the *Suez Canal* has been cut joining the Mediterranean and Red Seas, thus saving nearly 3000 miles on the journey to India and the Far East, by avoiding the sea route *via* Cape Town. The canal is nearly 100 miles in length, but of this one third is occupied by the passage through the lakes. Although the canal administra-

tion is international in character and the land for 3 miles on either side is neutral territory, yet Britain has the

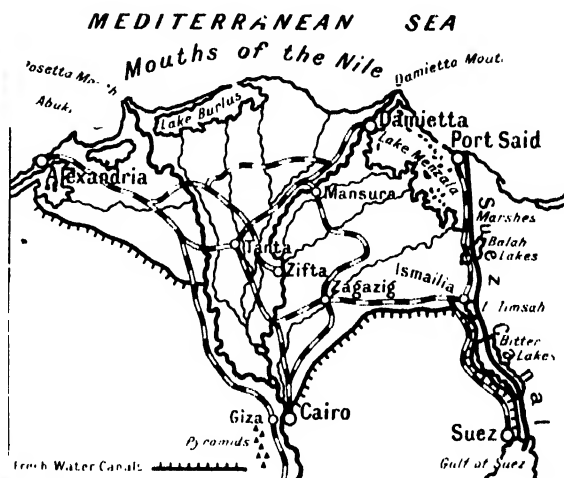


Fig. 7.—The Nile Delta and the Suez Canal.

largest financial interest in it, and 80 per cent. of the ships which pass through fly the British flag.

EXERCISES.

1. Describe the route taken (a) by a sailing vessel and (b) by a steamship between London and Bombay. Give reasons for the different routes taken by each.
2. Compare the salinity of the Red, the Mediterranean and the Baltic Seas. Give reasons for any differences between them. What is the difference in direction between the surface currents of the Baltic and Red Seas?
3. The following figures represent the number of ships which passed through the Suez Canal in 1910. By means of squared paper show the relative use of the canal by the nations mentioned—British 2800; German 650; French 250; Austrian and Hungarian 200; Russian 100; Italian 80; Norwegian 20; Turkish 30; Danish 40; Japanese 80; Spanish 30.

Surface.

Map 12 shows that the greater part of this region is occupied by the broad valley of the Nile, which at *Lado* descends from its upper plateau to its more navigable middle course. From *Lado* to *Khartum*, a distance of 800

miles, the river only descends 275 feet, and consequently its valley is almost at a dead level, although surrounded on either side by higher land. On the east is the *Abyssinian Plateau* continued by the *Red Sea Highlands*, which form the steep brink edge of the Red Sea Rift. On the south-west the land rises gradually to a broad crest in the *Niam Niam country*, which forms the water-parting between the Nile and Congo. West of the Nile the land rises to the arid plateaux of *Kordofan*, 1300 feet above sea level, while still farther west is the rugged, mountainous region of *Darfur*, connected with the *Tibesti Mountains* of the Sahara, with southern spurs forming the water-parting between the Nile and Lake Tchad drainage systems.

The Plateaux of Abyssinia and the Eastern Horn of Africa:—

In Chapter I. attention was drawn to the parallel brink edges bordering the *Red Sea Rift*. The western brink forms the eastern scarplands of the Plateau of Abyssinia, which rises precipitously from the low-lying coastlands bordering the Red Sea, and in the north slopes north-westward towards the plains of Sennar, while in the south-west it descends to the lower basin of the Blue Nile. The Abyssinian Plateau is the most elevated in the continent, having an average height of from 8000 to 10,000 feet. Its surface is cut into isolated blocks by huge clefts and fissures, while scattered over the plateau are mountain masses rising 6000 or 7000 feet above its level. In the north is a broad depression occupied by *Lake Tsana* or *Dembea*. The great crevasse in the plateau occupied by the *Takazze River* divides the tableland into two distinct sections.

South of *Ankober* the steep eastern edge of the plateau trends towards the south-west to join the brink edge of the *Eastern Rift Valley of Equatorial Africa*. This southern extension forms a distinct parting between *Gallaland* on the west and *Somaliland* on the east. Gallaland or Southern Abyssinia, although as lofty, is less rugged than the plateau proper, and is not cut into isolated blocks.

From the lower *Hawash Basin* notice a large triangular plateau forming the *Eastern Horn of Africa* and ending in *Cape Guardafui*. The northern edge of this forms a steep slope parallel to the precipitous shores of Southern Arabia. These slopes, rising from

the sandy coast-lands of the *Gulf of Aden*, in some places form rugged cliffs quite close to the coast, while in others the coastal plain is much wider. From its steep northern edge the plateau slopes gradually eastward to the lowlands bordering the eastern coast.

The island of *Socotra* is a north-eastern extension of the Eastern Horn of Africa, connected with the mainland by a number of bare islets known as the *Brothers*. Its surface is hilly and rises in the centre to a granite mass nearly 5000 feet high.

Between the precipitous edge of the plateau and the Red Sea is a narrow strip of desert land. In the south notice that although the brink edges of the Arabian and Abyssinian Plateaux remain parallel, the two coasts approach to within 15 miles of each other at the Strait of Bab-el-Mandeb. This leaves in the southern corner a triangular plain, backed by the Abyssinian and Gallaland plateaux on the west, and the Somaliland plateau on the south. This plain shows signs of recent volcanic activity, and from it rise several extinct cones, while near the *Upper Hawash* is a vast crater-like depression, and numerous hot springs are found in this region.

The streams known as *Khors* which drain from the plateau escarpment to the Red Sea, are intermittent and liable to sudden changes, dry beds being suddenly transformed into raging torrents.

Only along the eastern scarp of the Abyssinian Plateau is there anything approaching a definite mountain chain. This scarp forms a continuous wall 8000 feet high for a distance of 600 miles, and is only broken where the Hawash escapes to the coastal plain.

The loftiest part of the Abyssinian Plateau occurs in the bend of the Takazze River, where the *Simen Group* rise in *Ras Dashan* and *Mt. Buahit* to between 15,000 and 16,000 feet.

The great fissures which cut the Abyssinian Plateau into isolated blocks or *Ambas* illustrate the erosive action of running water. These gorges, often lined with six-sided columns of basalt similar to those of Fingal's Cave and the Giant's Causeway, are sometimes only a few feet wide, but their vertical sides are 5000 feet deep. The rivers at the bottom have regulated the slope of their channels so that in some places these narrow defiles can be ascended by boats.

The isolated block formation of the country has had a marked effect upon its history, enabling the inhabitants to maintain their independence. In the past, rival chiefs controlled the various areas, and the seat of government was changed as each in turn came into power. The steep edges of the plateau which rise from the desert coast-lands of Eritrea on the east, and the rapid rivers flowing to the west, have both hindered communication. Hence the Mohammedan invasion which spread across Africa from east to west did not touch Abyssinia, and its isolated peoples still profess an ancient form of Christianity.

The Arabian Desert, Red Sea Highlands, Sinai Peninsula:—

North of the Abyssinian Plateau the edge of the rift is continued by ranges of hills running south-east and north-west parallel with the Red Sea. The *Elba Mountains*, which give their name to the adjacent *Cape Elba*, rise to 7000 feet. From these northward a single chain extends to the *Isthmus of Suez*, and from it a rugged stony plateau slopes gradually westward to the Nile Valley. At the northern end of the Red Sea notice the *Gulf of Suez* and the *Gulf of Akaba*, between which rises the mountainous Sinai Peninsula.

The rift valley formation of Equatorial Africa and the Red Sea is continued northward through the *Gulf of Akaba* between the *Lebanon* and *Anti-Lebanon* mountains of Syria. The *Peninsula of Sinai* rises to a central mountain mass, which descends to lower plateaux on the north, forming the *Desert of the Wanderings*.

The Libyan Deserts:—

West of the *Nile Valley* the land rises gradually westward to a stony plateau from 600 to 1000 feet above the level of the river, and only broken here and there by sand-hills.

On the map notice a line of depressions occupied by oases, which stretch from the Nile south of the *Khargeh* oasis to the *Siva* oasis in the north. The line of these depressions is bordered by the steep sides of the plateau. These oases are fertile and present a striking contrast to the sand-hills of the desert, stretching to the coast and often reaching 300 or 400 feet.

The Nile Basin.

The Nile, 3500 miles in length, not only forms the connecting link between Equatorial Africa and the Mediterranean, irrigating a long, narrow, fertile belt stretching for 1800 miles across desert, but, owing to its close proximity to the Congo Basin, constitutes the great passageway from civilised Europe to the heart of undeveloped Africa. Without the great lakes at its source there would be no Nile, for those enable the river to maintain its flow through the desert. The tributaries, which flow from the Abyssinian Plateau augment this flow during the summer season, causing floods, when much of the fertile alluvium brought down by them is spread over the lands on either side of the river, rendering the banks very productive.

The Middle Nile. Lado to Khartum:—

The upper course of the river, and the lake reservoirs of *Albert*, *Edward*, and *Victoria*, have been described in the previous chapter. At *Lado* the river descends from the plateau to the plain, and has a long navigable course to the sixth cataract situated beyond *Khartum*. In this section, owing to the dead level of the country, vast accumulations of floating vegetation called *sudd* form islands and bars across the river, blocking the navigation and causing floods. Between *Lado* and the confluence of the *Bahr-el-Ghazel* the region forms a gigantic swamp due to this floating vegetation, the marshy region at the confluence forming *Lake No* during the summer rains. On the ninth parallel of latitude the river is joined by the *Bahr-el-Ghazel* from the west and the *Sobat* from the east. At *Fashoda* the river takes a northerly course, flowing as a sluggish river across the savannah lands of Egyptian Sudan, in some parts less than 300 yards wide, in others expanding to nearly 3 miles. In this section it receives no permanent affluents worthy of note.

The *Bahr-el-Ghazel* collects the waters of a number of streams which drain the higher lands of the *Niam Niam country*, forming the Congo-Nile water-parting, and also of many intermittent streams flowing from the higher lands of the *Darfur* country, which separates the drainage of this region from that of Lake Tchad. Chief among the latter streams is the *Bahr-el-Arab*, which flows south-west till it reaches the *Bahr-el-Ghazel*.

The *Sobat* drains the southern plateau of Abyssinia, and during its summer season carries much alluvium to the main stream, giving it a creamy appearance. Hence the main stream below this confluence is known as the *White Nile*.

Navigation is possible on the Upper Nile from Lake Albert to the edge of the Equatorial Plateau, but between this and Lado the river is obstructed by many waterfalls, which separate the upper from the middle navigation of the river. The sudd, which formed an obstacle to navigation in the middle course, is now cleared from the river, the reeds are burnt, and steamers break up the tangled mass of roots which are floated down stream.

The Blue Nile and the Drainage of Abyssinia:—

The Blue Nile rises in the highlands of Abyssinia and flows 70 miles westward to *Lake Tsana* or *Dembea*, forming a delta where it enters the lake. This lake occupies the flooded crater of an extinct volcano, and the Blue Nile leaves it on the south-east, where there is a deep breach 6000 feet above sea level. Flowing in a south-easterly direction, the river descends 2000 feet by a series of cataracts, and then makes a great semi-circular sweep round the Abyssinian Plateau to the *Plains of Sennar*, where, having almost reached the level of the main stream, it flows in a sluggish, winding channel north-west to its confluence at *Khartum*.

On the northern borders of Lake Tsana find the *Atbara*, which drains part of the northern plateau. This river has a variable volume depending upon the season, and is joined by the *Takazze*, a much larger stream rising in the *Simen Group of Mountains*, and flowing in a narrow gorge to join the Atbara where it descends to the plains of Sennar. From this point the river flows northward to meet the White Nile at *Berber*.

Upon these tributaries the whole prosperity of Egypt depends. When the summer rains fall on the plateau they increase forty-fold and form roaring torrents, carrying to the Nile vast quantities of water and much sediment. So valuable to Egypt are the resulting floods that gauges are placed at several stations along the river to measure the rise. A decrease of only a few feet in the height of the flood leaves large areas

barren, while an excess of a similar amount may deal destruction for miles.

Lake Tsana, with an area of 1200 square miles (equal to Staffordshire or Gloucestershire), is 1200 feet above the sea, and occupies a broad depression on the plateau. Its surface is dotted with many cone-shaped islets, while on its southern shores are found basaltic promontories.

Except the Blue Nile, all the rivers draining the plateau are unnavigable, and in their upper and middle courses vary in volume from roaring torrents in the wet season to mere trickling rivulets in the dry season.

Although the rain falls on the Abyssinian Plateau in June, the flood waters travel very slowly northward to the Nile and do not reach Cairo till the late autumn.

The Lower Nile. Berber to the Delta:—

North of *Berber* the Nile commences its remarkable course of 1800 miles in a valley which it has cut into the desert plateau, and receives no affluents for the whole distance. From its narrow valley, cliffs rise on either side, in some cases to 1000 feet. Notice on the map that between *Khartum* and *Berber* the river passes through its sixth cataract, and north of *Berber* there are five other cataracts, the second, third, fourth, and fifth being in the great S-shaped bend of the stream. These are in no sense waterfalls, but occur where the river crosses east and west ridges of granite and syenite, and consist of long series of reefs, which, except at low water, do not obstruct navigation. As the lower Nile has a gradient of only 18 inches to a mile (which in the delta is reduced to less than 4 inches), it forms a placid stream. The long, narrow valley of the river terminates at *Cairo*, where the Nile branches into many channels, of which the chief are the *Rosetta* and *Damietta*. Between these two arms is the *Delta of the Nile*, the most fertile region of all North Africa. The apex of the delta is at *Cairo*, and its base extends for 150 miles along the Mediterranean shore between *Alexandria* and *Port Said*.

Notice on the map a stream which flows parallel to the lower course of the Nile, ending in *Birket-el-Qarun* (*Lake Moeris*). This stream is a distributary, carrying water from the Nile to the *Fayum depression*, an exceedingly productive region which is irrigated by the flood-waters of the river.

The Irrigation of the Nile.

It has been shown that the prosperity of Egypt depends almost entirely upon the flood waters of the rivers which drain from the Abyssinian Plateau. These not only irrigate the lands on either side, but through countless ages have brought fertile alluvium, which in some places now covers the land to a depth of 30 to 40 feet.

Irrigation is necessary in this region, not only to utilise the floods to the best advantage, but also to water the land during the dry season, and to store up water in case the floods do not bring a sufficient amount in any one year. Both perennial and flood irrigation systems are now used.

Flood Irrigation.—This system consists in dividing the land on either side of the river into a number of basins by means of dykes or embankments. These are connected by shallow canals to the river, and thus each basin is not only saturated with water but also covered with fertile alluvium. The disadvantage of this system is that only one crop can be produced per year, and as the floods do not occur in the Lower Nile until late autumn, this must be a crop capable of withstanding the winter temperature.

Perennial Irrigation.—In past ages water wheels and water lifts have been used during the dry season to pump water so that more than one crop per year could be grown. This irrigation was however confined to small areas, but since British control in Egypt, dams or barrages have been erected across the *Rosetta* and *Damietta* branches of the river, and at *Aswan* and *Siut*. These dams have converted the river into great reservoirs. In flood time the sluices are opened to let the water through, but when the level of the river falls, the sluices are shut and sufficient water is held back to allow of it being carried from the river by canals. This irrigation allows of the growth of summer crops in the basins, which otherwise would be baked hard, but its great drawback is that the alluvium sinks to the bottom of the river instead of being deposited on the land, the latter having to be artificially fertilised. A canal now conveys some of the water held back by the Siut dam to the Fayum Depression.

The Drainage of the Eastern Horn of Africa:—

The rivers which drain the slopes of the plateau to the Red Sea are intermittent, as also are the streams draining the northern slope of Somaliland to the Gulf of Aden. None of these streams are of any length except the *Hawash*, which, rising in Southern Abyssinia, makes a

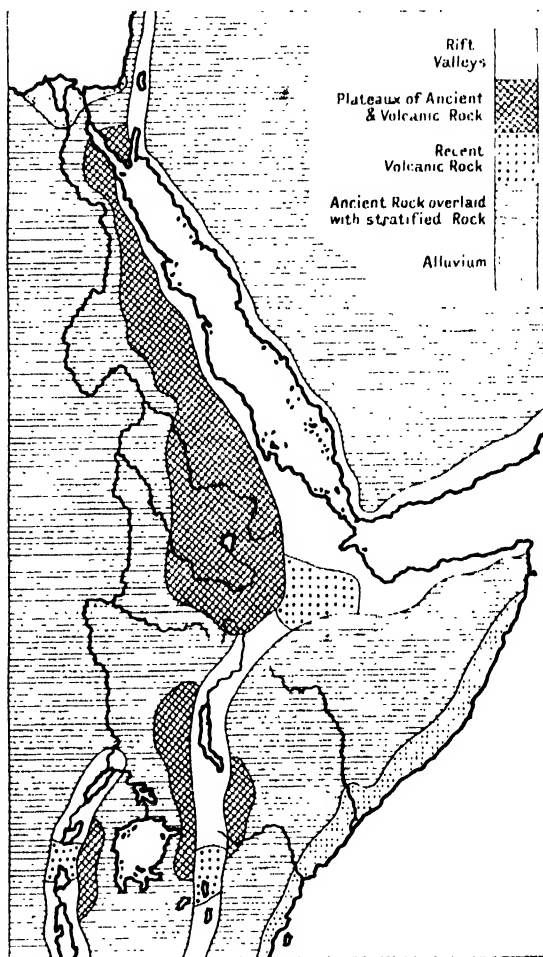


Fig. 8. Rock Structure, North-East Africa.

semi-circular bend, and flowing through the Eastern Rift enters the triangular plain at the southern end of the Red Sea. Even this stream does not reach the sea but flows to a depression 65 miles from the coast. Near the Hawash find the *River Omo*, which flows south to *Lake Rudolf* in the rift.

Draining the more gradual slope of the plateau to the south-east are the long rivers *Webi* and *Juba*, the latter forming

in its lower course the boundary between British East Africa and Italian Somaliland. The *Webi* for part of its course flows through desert, and hence the river dries up before it reaches the coast.

Rock Structure.

The eastern part of this region exhibits everywhere signs of great internal earth movements. Basalts and trachytes are prevalent, vast lava flows cover much of the surface, while the yellow and red soils are due to the weathering of lava and other volcanic rocks. In the plain drained by the Hawash more recent signs of volcanic activity are visible, as witnessed by the volcanic cones and hot springs already mentioned.

The Nile Basin forms a continuation of the structure of Southern Africa, and this structure is continued into Asia. The ancient rock masses on either side of the Nile are overlaid with masses of sandstone in the south, and limestone farther north. Through these the river has carved its course, and cliffs on either side of the river are formed of these materials, while the cataracts consist of granite and other hard rocks, forming reefs through which the river has not been able to cut an even channel. The granite, limestone, and sandstone provide valuable building material. Nearer the delta the limestone dips down and is overlaid with younger rocks.

EXERCISES.

1. Describe the surface and rock structure of Abyssinia and show its relation both to the surface of South-Western Asia and the Equatorial Plateau of Africa.
2. Describe the Blue Nile and illustrate by a sketch map. Explain how the prosperity of Egypt depends chiefly upon the Abyssinian tributaries of the Nile.
3. Describe the flood and perennial systems of irrigation used in Egypt. What are the advantages and disadvantages of each?
4. Describe the Nile, and give reasons why it is able to maintain its level throughout the year.
5. Write a short description of each of the following:—
 - (a) The Sudd.
 - (b) The Khors.
 - (c) The Fayum Depression.
 - (d) Lake Tsana or Dembea.

6. Compare the Congo and Nile Rivers. Draw a sketch map showing the connection between the upper courses of both rivers.
7. Show what kind of stream the Nile would become if the lakes of the Equatorial Plateau no longer drained to it.
8. Describe the surface and drainage of Eastern Horn of Africa. Illustrate by a sketch map.
9. Describe the rock structure of the Nile Basin. Show its effect (1) on the fertility of the region, (2) upon the navigation of the river, and (3) on the supply of building material.

Climate.

As the Nile possesses a northerly course of 3500 miles, reaching from the equator to the Mediterranean, it passes through different zones of climate varying with their latitudes. In the far south of this region, where the river descends from its upper plateau course to the plain, there are torrential rains during ten months of the year, but the rainfall and the length of the wet season decrease farther north, until in Egypt Proper there is an area practically devoid of rain, except on the higher lands bordering the Red Sea and the mountainous Sinai Peninsula.

Maps 2 and 3 show that the region of greatest heat shifts north and south with the seasons, and Maps 4 and 5 show that the rainfall conditions have similar variations. Hence in Egyptian Sudan there are two well-defined seasons, a dry one from October to April, and a wet season for the remainder of the year. These summer rains are accompanied by severe thunderstorms, and the water-courses, which during the winter have been dry, now become mighty streams which overflow their banks. Khartum is near the northern limit of the tropical rains, and hence in Egypt Proper there is a marked absence of any regular rainfall. Nowhere does it exceed 3 or 4 inches in the year except on the Red Sea Highlands, while west of the river there are areas which do not get rain for several consecutive years. This area lies within the zone of constant North-East Trades, which come from the land mass of Asia, and although in summer these winds blow to a region of low pressure over the Sahara, yet, blowing to warmer regions, their temperature is constantly being raised, and thus they are capable of evaporating

moisture instead of condensing it. The *Khamsin*, a dry, sand-laden wind blowing from February to June, causes a rise in temperature.

The plateau of Abyssinia has different zones of climate varying with the elevation. The lower lands have a marshy, unhealthy climate similar to that of the Sudan. Above 5000 feet is a warm, temperate zone, and this is succeeded beyond 9000 feet by a cool, temperate, healthy region suitable for Europeans. The elevation of the plateau and the region of low pressure over the Sahara are responsible for heavy summer rains. Winds blowing inland towards the low-pressure area rise to get over the plateau, condense, and deposit heavy rains, which flood the rivers draining towards the Nile. In winter the pressure is increased, and there are consequently outward flowing dry winds.

The plateau of the Eastern Horn of Africa is much lower, and the winds blowing into Abyssinia flow parallel to the coast, hence there is only a slight rainfall, and this decreases towards the south-east where the arid conditions cause the Nugal Desert.

The Red Sea coast-lands are for the most part arid, sandy plains, receiving only a little rain in summer, when the khors or dried river courses are filled with water and flow across the plain to the Red Sea.

Owing to the unhealthy, tropical climate in the Southern Sudan, Gondokoro less than 5° N. of the equator, had to yield its importance to the new station of Lado, which, although 15 miles higher up the river, is much more healthy, owing to its elevated position. In the flooded areas of Southern Sudan, near the rivers, the great drawback to settlement is the prevalence of ague and marsh fevers.

In some parts of the Sudan there is a range of 40° F. between the summer and winter temperatures (98° to 100° F. in summer, and 58° to 60° F. in winter), and snow sometimes falls on the uplands of Darfur. This range of temperature increases with distance from the equator, and in Egypt Proper there is not only a great seasonal variation, but also a marked difference between the day and night temperatures. The effect of this daily variation, acting on the flooded lands on either side of the river, is to cause great evaporation in the daytime and heavy falls of dew at night.

Owing to the dry climate and the consequent absence of the weathering effects of atmospheric moisture, the sphinxes and pyramids of Egypt are in a wonderful state of preservation.

The rainfall of Egypt increases towards the Delta, where winds from the Mediterranean bring showers to the coast-lands of the delta. The Red Sea Highlands and the mountainous Sinai Peninsula get a fairly heavy rainfall, the latter being subject to heavy thunderstorms from December to February, and the summits of the highest mountains get light falls of snow.

In Southern Abyssinia, owing to the nearer approach to equatorial conditions, there are two wet seasons. These are due to the migrations of the sun's vertical rays northward in summer towards the Tropic of Cancer. Between March and September every place between the equator and the Tropic of Cancer will receive the vertical rays of the sun twice. The great evaporation when the sun is shining vertically gives these parts an increased rainfall.

EXERCISES.

1. Name the different zones of climate through which the Nile passes. State the climatic conditions upon which each of these zones depend.
2. Account for the summer rains of Abyssinia, and explain why the Eastern Horn of Africa receives little rain.
3. Show the effect of elevation upon climate. Illustrate your answer by reference to this region.
4. How far is it true to say that the range of temperature increases with distance from the equator. Give examples from this region justifying your answer.
5. Explain why the rainfall decreases as we travel northward in the Nile Region.
6. Explain why the streams draining to the Red Sea are intermittent, and why those of Italian Somaliland do not reach the coast.

Flora.

The climatic changes from heavy rainfall in the south to drought in the north, and the increased range of temperature with distance north of the equator has its consequent effect on the flora, which passes from tropical forests on the Congo divide, through open woods, savannahs, and steppes, to desert

conditions, except where the flood waters of the Nile have caused a narrow band of green vegetation, which links the Mediterranean to Tropical Africa.

To the east of the river valley the zones of vegetation are determined largely by the elevation, lands below 5000 feet having a temperature of 80° F. produce a tropical vegetation, and forests clothe these lower slopes. The warm temperate lands, between 5000 and 8000 feet, have a vegetation corresponding to that of Southern Europe, while these give place above 8000 feet to cooler temperatures, in which grass is the predominant growth.

The Eastern Horn of Africa, having a dry climate, consists chiefly of poor pasture, and only in the upper course of the Webi do other products grow.

The valleys cut by the feeders of the Bahr-el Ghazel in the Niam Niam country are clothed with forests of tropical vegetation, yielding *rubber* and other products, while the lower valleys of these rivers, and of the Nile proper to Fashoda, consist of *papyrus* covered swamps in which *crocodiles* abound.

Ebony is obtained from the forests bordering the White Nile, while those which line the banks of the Blue Nile to the Abyssinian frontier are capable of producing valuable *timber* exports. The higher lands of Kordofan yield quantities of *gum*, which is one of the most important exports.

The savannah lands which replace the tropical forests and cover large areas to the west of the Middle Nile are prairies of tall grass with trees dotted here and there. This grass provides food for *cattle*, *sheep*, and *goats*, which the native inhabitants rear. The *ostriches*, which roam wild, are caught for the sake of their feathers.

As rainfall decreases farther north, the trees disappear, and poor grass land is found on the desert edge. In Egypt Proper natural vegetation does not exist even in the fertile lands on either side of the river, unless we include the *aquatic plants* of the river edge and the *thorny scrub* of the desert.

Cultivated and other Products of Commercial Importance:—

Along the Blue Nile the soil is very fertile, and lands which now produce *millet*, *maize* and *pulses* could be turned into rich *cotton* and *wheat* producing areas.

Since Egyptian Sudan has had a settled government, large irrigation works have been established in Dongola, and *cotton* of excellent quality is being grown. The extension of these irrigation works to other parts of this state, so that crops might be produced all the year, should cause an increased growth of *rice* and *cultivated rubber* in the south, and *wheat* and *cotton* farther north.

The natives have now been encouraged to export their *cattle*, and *sheep*, and large quantities of these for slaughtering purposes are now sent through Egypt Proper.

In Egypt Proper perennial irrigation has made possible the growth of two or more crops per year. Before, only those crops which could withstand a winter temperature could be grown, while during the summer the sun-baked soil in the flood basins lay idle. Thus, only such products as *wheat*, *barley*, *flax*, *onions*, *beans*, *lentils*, and other *pulses* were produced. Perennial irrigation has extended the resources to the cultivation of *cotton*, *sugar*, *rice* (in the delta), *maize* and *indigo* during the summer months. The larger growth of cotton, besides increasing the value of Egyptian exports, has helped to satisfy the demand of Britain for raw material.

In Abyssinia the most important product is *coffee*, the name being derived from *Kaffaland*, part of Southern Abyssinia. The tropical, lower slopes also produce *bananas*, *sugar*, *cotton* and *indigo*, while *ebony* is obtained from the forests. *Vines*, *oranges*, *wheat* and *maize* are grown in the warm temperate zone, and *oats* on the higher lands. Much of the land is, however, devoted to pasture, on which feed *cattle*, *sheep*, *goats* and *horses*, while *Ogaden* in the south rears fine *camels*.

The inhabitants of Somaliland are chiefly nomadic shepherds feeding *camels*, *sheep* and *goats* on the poor pasture, but in the upper valleys of the Webi *frankincense*, *myrrh*, *balsams*, and *coffee* are grown for trade purposes.

Fauna.

The distribution of animals bears a marked resemblance to that of vegetation and rainfall. In the savannah lands of the Sudan roam herds of *elephants*, *gazelles* and other species of *antelopes*, *buffaloes*, *giraffes* and *zebras*. *Chimpanzees* frequent the forests of the

Congo-Nile divide, while *hippopotami* and *crocodiles* are prevalent in the swamps of the White Nile and its tributaries, but are never seen below the third cataract of the Lower Nile. *Lions*, *leopards*, *hyenas*, and *gazelles* are found in the grass lands of Nubia, and *rhinoceroses* in the middle course of the Atbara. In Egypt Proper the number of wild animals is much less. *Hyenas* and *jackals* make a home in the limestone caves of the plateau, and *leopards* are found in the Sinai Peninsula, but the other wild animals disappear where the Nile begins its course across the desert.

Wild animals similar to those of the Sudan are found in Abyssinia, and in Somaliland *elephants* provide *ivory* for export.

Numerous aquatic birds, of which the chief is the *crane*, frequent the marshes of the Nile valley, while *flamingoes* and *herons* are found in the Nile delta. The marshes are also infested with swarms of *mosquitoes*, and the bite of the *blood fly* is almost as deadly as that of the tsetse fly of Equatorial Africa. *Reptiles* are numerous in the Sudan region, snakes being found from 5 to 6 feet long.

The chief domestic animals of Sudan and Abyssinia have already been mentioned, and also the camels of Ogaden. In Egypt Proper the chief domestic animals are the *horse*, *ass*, and *mule*, *buffaloes* and *oxen* being used for draught purposes. *Camels* appear to have been introduced by Arab traders, and these are now used on the numerous caravan routes which connect the Nile valley with other regions.

In Abyssinia the *civet cat* is kept in captivity for the sake of the *musk*, which forms an important article of export in this region.

Minerals.

These are of little importance in Egypt Proper. *Salt* is obtained from the coastlands west of the delta, and the *granite*, *sandstone*, and *limestone* provide an inexhaustible supply of building material, the *clays* of the Nile being used for bricks and pottery. Farther south, in Egyptian Sudan, rich supplies of *iron ore* are found in the Congo-Nile water-divide, and *copper* in the Darfur country. Abyssinia, although at present not yielding large quantities for export, is known to be rich in minerals, especially *gold*, and the natives use local supplies of *iron* in making agricultural and war implements. *Silver*, *copper*, and *sulphur* are found in small

quantities, and bars of *salt* form a medium of exchange in some parts.

The *granite* from Aswan was used in the building of the huge temples and pyramids, and in more modern times has proved serviceable in the construction of great dams.

Gold in the Elba Hills, *silver*, *sulphur*, and *petroleum*, in addition to mines yielding *topaz* and *emeralds*, were formerly worked, but do not now yield anything to commerce.

At present *gold* is chiefly obtained from Abyssinia by means of washings, but although not thoroughly surveyed there exist rich supplies of gold, south of the Blue Nile, and it was from this region that the Queen of Sheba is supposed to have drawn the treasures which she presented to Solomon. In the past these mines were worked, and yielded both nuggets and gold quartz in considerable quantities, the gold washings alone yielding a large annual output.

EXERCISES.

1. In what way does the distribution of vegetation correspond with the distribution of rainfall in North-East Africa?
2. Show the effect of elevation upon the climate and vegetation of Abyssinia.
3. Describe the forms of irrigation used in the Nile Valley. Show how modern improvements have been of commercial importance both to Egypt and Britain.
4. What are the chief vegetable and animal productions of the Egyptian savannah lands? Explain how the application of irrigation schemes would increase the cultivated products of Egypt.
5. Describe the mineral wealth of Egypt, and show the use made of the supplies of granite and building stone, both by the Ancient Egyptians and in modern times.
6. "Without the great lakes there would be no Nile, without the Blue Nile there would be no Egypt." Discuss the truth of this statement.
7. Show how the distribution of animal life in North-East Africa is largely determined by the distribution of rainfall and vegetation.
8. Explain—
 - (1) Why heavy falls of dew are prevalent in Egypt Proper; and
 - (2) Why the monuments of Ancient Egypt are in such an excellent state of preservation.

Routes.

The railway routes and river navigation are not only necessary to the full development of this region, but as the Nile forms a connecting link between Equatorial Africa and the Mediterranean, this valley may provide an important passage for the products of Central Africa to reach *Alexandria*, which is within easy reach of the trade centres of Europe. It has been already shown in the previous chapter that the Congo, Nile, and Lake Tchad drainage systems are closely connected, and this arrangement of physical features will facilitate through communications.

Railways :—

Take Blank Map 2 from the front of the book and place it under Route Map 13, so that the two outlines coincide. Trace the following routes, and notice the physical features used by each.

From *Cairo* a route follows the valley of the river southward *via Siut* to *Tonia*, 10 miles south of *Aswan*. From *Tonia* to *Halfa* the railway has not yet been built, and passengers between these places have to utilise river navigation. Beyond *Halfa* trace the route to *Khartum*, and notice that the railway avoids the great bend of the Nile by cutting across country to *Abu Hammed*, and so to *Berber* and *Khartum*. From the latter place this line has been continued to *Sennar* on the *Blue Nile*, and construction is now rapidly proceeding to *Fashoda* on the Nile proper, from which place the projected route follows the Nile valley to *Lado* and East Africa. This route will be eventually linked to the Uganda Railway and to the route which has been carried northward from Cape Town *via* Bulawayo and the Victoria Falls into the Congo Basin, making through communication between Cape Town and Cairo.

From *Sennar* notice the route which has been constructed to *El Obeid* in Kordofan, the great caravan route centre of the west.

The railway from *Berber* to *Port Sudan* provides a quick outlet to the sea for the produce of Egyptian Sudan, and will increase in importance with the full development of this state.

Cairo has railway communication with *Alexandria*, its chief port, with *Port Said* at

the northern entrance of the Suez Canal, and with *Suez* at its southern entrance.

The French have carried a railway from their port of *Jibuti*, on the Straits of Bab-el-Mandeb, to *Harar*, the caravan route centre of Southern Abyssinia, and this will eventually be continued to *Addis Abeba*, the capital. From the Italian port of *Massuah*, on the Eritrean coast of the Red Sea, the Italians have carried two lines inland to the plateau edge, the more northerly of these is projected to *Kassala*, which being on the borders of South-East Sudan will tap its resources, the more southerly will be connected *via Axum* to *Gondar*, the route centre of Northern Abyssinia.

River Communications :—

A canal joins the western branch of the Nile to Alexandria, and a second connects another arm of the delta to *Ismailia* and *Suez* (see fig. 7). These give Cairo easy access to both the Mediterranean and Red Seas. There is a regular steamboat service between *Cairo* and *Aswan*, running in connection with another service between the first and second cataracts to *Wadi Halfa*. There is also a through service of steamboats from *Khartum* to *Lado* at the southern border of this region, and these are run in connection with the steamer service on the *Upper Nile* to *Lake Albert*. Steamboats navigate the lower course of the Blue Nile from *Khartum*.

Since the death of King Leopold in 1910 a piece of land known as the *Lado Enclave*, between the Nile and the thirtieth meridian of longitude, has been transferred from Belgian to British control, and this should facilitate our communications between the Nile and the Congo.

Caravan Routes :—

Although railway and river communications have been established in the river valley, yet most of the transit trade to regions farther removed from the river is carried on by means of camel caravans. Map 13 shows the chief caravan routes. Trace those leading westward from the river valley (1) to *Tripoli*, and (2) to the *Darfur* country, and notice the oases used by these routes. The convergence of several caravan routes caused the growth of trade centres. Find *El Obeid* in Kordofan, where routes from *Darfur*, *Lake Tchad*, *Khartum*, and *Dongola*

meet. This town is the outlet for the wheat and copper of Darfur and Egyptian Sudan, and has now railway connection with *Sennar* on the main line from Cairo.

East of the Nile there are two important caravan routes: (1) leading to *Kosseir*, the port for the caravan trade on the Red Sea; and (2) to *Suakin*, which is used by many Mohammedan pilgrims *en route* to Mecca. The importance of this latter route for trade purposes has been neutralised by the railway from the adjoining town of Port Sudan to Berber.

Farther southwards, both in Abyssinia and Somaliland, the transit trade is chiefly carried on by caravans. The two chief caravan centres are *Gondar* in the north, to which the Italians are projecting a railway, and *Harar* in the south, in railway communication with Jibuti. From Harar trace the caravan routes which lead through Somaliland to the British ports of *Berbera*, *Bulhar*, and *Zeila*. The importance of these has declined since the construction of the French railway.

EXERCISES.

1. Show how the proximity of the upper courses of the river systems of Africa should facilitate railway communications.
2. Draw a sketch map of the Nile Basin. Mark the parts of the river which are navigable for river steamers, and insert the chief railway routes.
3. Describe a journey from Cairo to Mombasa, naming the physical features passed through and the methods of conveyance in different parts.
4. Show how the convergence of routes has made El Obeid, Harar, and Khartum important.
5. Describe the exact position of Cairo, and show how position has made it important. Name the chief land and water communications between Cairo and the remainder of this region.
6. Name the chief caravan routes of this region. In which parts are these being superseded by railways?

Commerce, Seaports, Trade Centres.

Egyptian Sudan:—

Since 1899, when the power of the Khalifa was overthrown and British influence became paramount in this region, the products of

this country have increased largely, and this increase will become more pronounced as railway and irrigation schemes are more fully developed. At present the chief exports are *gum, ivory, ostrich feathers, dates, cereals, and cotton*. The two latter will probably become more important in the near future. The exports are exchanged for *clothing, machinery, and railway material*. A great part of the trade finds an outlet through the railway from *Berber* to the rising *Port Sudan*, but Italians are trying to induce commercial traffic to pass through *Kassala* on their Eritrean border, to which town they are building a railway from their port of *Massuah*. Much of the produce of the north and west is carried northwards *via* the rail and river navigation of the Nile Valley.

Port Sudan and *Suakin* are situated on the Red Sea coast, where the great easterly bend of the Nile makes it possible to build a railway only 260 miles in length to connect Berber with Port Sudan. This town is rapidly increasing in importance, but Suakin, built on a coral islet adjacent to the shore, has a decreasing trade, and owes its present importance largely to the pilgrims who here take boat for Mecca.

The chief inland centres are found where the confluence of rivers has caused the growth of trade, or at the converging point of several caravan routes.

Khartum, the capital, at the confluence of the Blue and White Nile, is the chief trade depôt of this region. It commands both the railway communications and river navigation of the Sudan, and by reason of its position can control the whole supply of flood waters and alluvium upon which the fertility of Egypt depends.

Berber is situated just north of the confluence of the Athara and Nile, and near the junction of the railway from Port Sudan with the line from Cairo to Khartum.

Dongola is the centre of a dense agricultural population which occupies the region in the westerly bend of the Nile. The large irrigation works established here are increasing the output of this area.

Fashoda, north of the confluence of the Sobat and Bahr-el-Ghazel, has an unhealthy situation in the swamps of the Middle Nile. This town is merely a collection of native huts, and owes its importance mainly to the convergence of routes following these river valleys.

Lado, at the southern limit of the Middle Nile navigation, is situated on elevated land, and thus is increasing in importance, while the lower and more unhealthy *Gondokoro* is decaying.

El Obeid, in Kordofan, has already been mentioned as a converging centre of many caravan routes.

Egypt Proper :—

The vast irrigation works and railways which have been constructed in Egypt since Britain assumed financial control of this region have increased trade to a great extent. Large supplies of *cotton, wheat, maize, barley, sugar, rice, pulses*, and other products are exported, chiefly to Britain, and nearly all this trade passes through *Alexandria* to the west of the delta.

Alexandria lies partly on the mainland and partly on a broad artificial promontory nearly a mile long and three-quarters of a mile broad, which connects the mainland to the island of Pharos. Extensive harbour works and docks have been constructed in modern times, and large vessels can enter at all periods.

Rosetta and *Damietta* are small seaports decreasing in importance, whose chief trade is with Turkey and the Eastern Mediterranean coasts.

Port Said is an important coaling station and depôt for Eastern goods, at the Mediterranean entrance to the Suez Canal. *Ismailia*, on Lake Timsah, has canal communication with Cairo; and *Suez* at the southern entrance to the canal remains chiefly an Arab town, receiving very little benefit from the great transit trade which passes through the canal.

Kossair has a harbour of coral formation on the Red Sea. Before the opening of the Suez Canal it had an important export of wheat brought by the caravan traders to the coast, and exchanged for rice, coffee, spices and gums. The opening of the canal has caused this town to decrease rapidly in importance.

Inland, as in Egyptian Sudan, the chief centres are at the converging points of important routes.

Cairo, the capital and the largest city in Africa, stands at the apex of the delta. It is the tourist centre for the Lower Nile, and has railway and water communication with the coast and the Suez Canal, in addition to the railway com-

munication with Khartum and the Sudan.

Siut, the chief town of Upper Egypt, has a pottery industry, and is situated where a great irrigation dam has been constructed across the Nile.

Aswan, situated at the first cataract of the Nile, has become important in the river navigation. Regular services of steamers ply between Aswan and Cairo, and also between Aswan and Halfa. A second great irrigation dam has here been built across the Nile.

Halfa, situated at the second cataract and on the southern boundary of Egypt Proper, is a converging point of rail, caravan, and water communication. Here the railway leaves the valley of the river and cuts across to Abu Hammed to avoid the bend in the river.

Medinet-el-Fayum is the chief town of the irrigated Fayum depression to the left of the Nile.

Zagazig is the most important town in the eastern part of the delta, and is surrounded by productive cotton plantations. Its position at the junction of several railways renders it an important trade centre.

Abyssinia and the Eastern Horn of Africa :—

The trade of this region is small. As Abyssinia possesses no seaboard her products reach the coast through *Italian Eritrea, French Obok, or British Somaliland*. A great part of the trade from the rich southern lands of Abyssinia was once brought by caravan to *Berbera, Bulhar, and Zeila*, ports of British Somaliland, but the French railway to *Jibuti* has caused the divergence of this trade to that port. Many products of Northern Abyssinia find an outlet through the Italian port of *Massuah*. Along the Italian seaboard of Somaliland there are no large seaports, *Mogdishu* and *Brava* being the chief, and these send their cattle products to *Zanzibar*, from whence they are shipped to Europe and America.

The chief exports of *Abyssinia* are *coffee, hides, skins, wax, ivory, rubber, gum arabic and musk* (from the civet cat).

Gondar is situated on the Tsana plain, and in addition to its importance as the route centre of Northern Abyssinia, is the religious capital.

Adua, 110 miles inland from Massuah, is another trade centre on the route between Gondar and the coast.

Sokoto, in the Takazze basin, is an important market, and does a large trade in *salt bricks*.

Harar, with a population of 50,000, is by far the largest town. Its importance as a route centre has already been mentioned.

Italian Eritrea:—

On the Eritrean coast of the Red Sea the only important town is *Massuah*, built on a coral islet. This town not only has a trade in *pearls* and *palm-nuts*, which are its chief products, but exports much of the produce of Abyssinia. The continuation of the Italian railways into Abyssinia will probably increase this trade.

French Somaliland:—

This small colony has practically no trade of its own, and its commercial importance depends solely upon the railway inland from the port of *Jibuti*.

British Somaliland:—

There are three ports along the shores of the Gulf of Aden—*Berbera*, *Bulhar*, and *Zeila*. Of these Berbera possesses the best harbour, but the oldest and most frequented caravan route from Abyssinia terminates at Bulhar, from which most of the goods are transferred to Berbera for shipment.

EXERCISES.

1. Describe the position of the chief ports of the Red Sea, and the hinterland and trade of each of them.
2. Describe the position and importance of Alexandria and Port Said. Explain how the trade of one differs from that of the other.
3. Name the chief exports of both Egypt and Egyptian Sudan. Which of these products are most valuable to Britain? Give reasons.
4. Name the chief exports of Abyssinia. Show how these are conveyed to the coast.

Population.

A study of the population in this region shows the close relationship between the distributions of vegetation and population. In Egypt Proper, of the total area

of 400,000 square miles, the greater part is unoccupied desert, and in the 12,000 square miles of cultivated land bordering the river there is a population of over 10,000,000. This gives an average density of 930 to the square mile, while the wandering Arab population of the desert only numbers 97,000, giving an average of one person to each 5 square miles.

Although the average of Egyptian Sudan reveals a density of only three to the square mile, yet it must be remembered that the savannah lands are occupied by a scattered population of nomadic peoples, and that along the river valleys, where the people lead a settled life, the population is denser.

In Abyssinia, if we omit Harar with a population of 50,000 and Addis Abeba, the capital, with 30,000, there is no town of any size, and the majority of the country is thinly peopled, while the density of population is only seven to the square mile. It is still less in British and Italian Somaliland, where the average density decreases to five persons to the square mile, and the only centres of population are the ports along the coast.

Peoples.

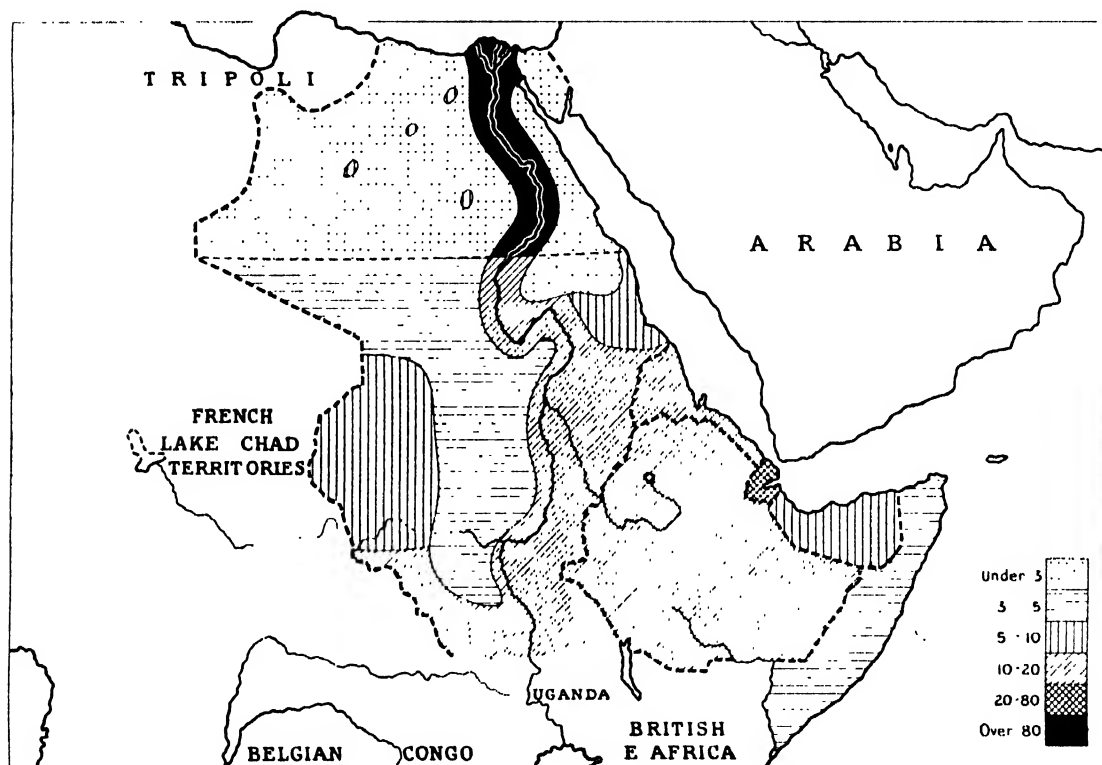
The transition from equatorial climate and vegetation, through savannah lands to desert conditions bordering the Mediterranean, has an interesting parallel in the distribution of the races. In the Upper Nile Basin and the Sobat are pagans of true *Negro* stock, but as we proceed northward to the savannah lands these decrease in number and the *Arabs* preponderate. *Mixed Negroid races* are common in this region; in the Darfur country there are both Arab and Negro peoples, but in Kordofan and between the Sobat and the Blue Nile there are pure Arab peoples. The Arabs are chiefly a nomadic, pastoral race, rearing herds of camels, horses, and goats, but near the confluence of the Blue and White Niles they lead a settled agricultural life.

In Egypt and Nubia the Negro inhabitants decrease in numbers, and, although possessing the features of their race, have much fairer complexions. In this area they till the soil and do much of the menial labour. The white races, who predominate in Egypt Proper, are

the *Fellahin*, *Copts*, and *Arabs*. The *Fellahin* are quiet, industrious, and peaceful, tilling the fertile lands of the Nile valley. The *Copts*, distinguished by their black turbans, live chiefly in the towns, and profess an elementary form of Christianity resembling in some respects that of the Greek Church. The *Arabs* are still the nomadic traders of the desert, but many of them have settled in the towns, where contact with

greater part of Somaliland and Gallaland in the south. On the coastal plains bordering the Red Sea and Somaliland are *Arab* descendants of the early traders of this coast, while along the more accessible northern edge of the plateau live mixed races of *Negro*, *Arab*, and *Hamitic* descent. In the valleys of the Upper Webi are found *Bantu* races, probably descendants from slaves imported in early days to this

Map 14.



NORTH-EAST AFRICA—POPULATION.

Turks and other European immigrants has made them very indolent.

The plateau surface of Abyssinia has had its effect on the distribution of the races. This difficulty of access caused that Arab invasion which swept across the continent from east to west, converting the whole to the Mohammedan religion, to leave Abyssinia untouched, and consequently its peoples form a pure *Ethiopian branch* of the *Hamitic* race, professing the Coptic form of Christianity. This race also inhabits the

area. In the south of Somaliland and Gallaland, where the lower lands are more accessible, there exist mixed races of Hamitic and Negro peoples.

History.

Egypt and Egyptian Sudan :—

With the history of Egypt dawned the earliest recorded history of Africa. In 4400 B.C. the first great Egyptian Empire was founded, and the pyramids

of *Gizeh* and *Memphis* near Cairo, the monuments and temples of *Thebes* near the modern town of *Luxor*, and the tombs, sculptures, statues, sphinxes, obelisks, and temples which line the Nile banks for a considerable distance beyond the Egyptian frontier, are evidences of the power of this kingdom. These monuments and the great engineering feat of utilising the flood waters of the Nile to irrigate the *Fayum depression* show that a high state of civilisation was reached in these early ages.

In the early part of the Christian Era Egypt, like the other nations of the civilised world, succumbed to Roman invasion, and following this invasion came the introduction of Christianity, which has had its effect on the history of Egypt till the present day. The Roman occupation was followed by a great Mohammedan-Arab conquest which lasted for 900 years.

In the sixteenth century the Turks obtained control in Egypt, but deputed most of their power to the Egyptian rulers. At the close of the eighteenth century Nelson's defeat of the French fleet at *Abukir Bay* (see fig. 7) made it impossible for the French to hold the country. Since then Egypt has been practically independent, although nominally under Turkey. In 1882 a rebellion caused Britain to bombard *Alexandria*, and the British army to occupy Egypt. Since that time the finances have been under an adviser appointed by Britain, the Egyptian army has been reorganised, compulsory labour abolished, and irrigation works constructed, all of which have increased the prosperity and security of the country.

Between 1800 and 1860 Egypt steadily advanced her boundaries southward to include the whole of the Nile Basin, and westward towards the water-parting between Lake Tchad and the Nile, but bad government, heavy taxation, and the corrupt methods of administration used by the government officials caused a rebellion. This fanatical *Mohammedan rebellion*, led by the *Mahdi* (the Guided—the successor to the Prophet), spread rapidly, and Egypt lost ground until *Khartum* was captured in 1885, and its gallant defender, General Gordon, murdered. The Mahdists then overran the whole Sudan, advancing as far as *Suakin*, which was held by a British

garrison. For ten years Egypt abandoned the whole of her possessions south of Halfa, and *Emin Pasha*, the Egyptian governor of the Equatorial Nile, had to retreat from the capital, Lado, to Wadelai near Lake Albert, where he was relieved by the Stanley Expedition of 1889. The death of the Mahdi, who was the moving spirit of the rebellion, and the weaker rule of his successor, the Khalifa, resulted in his defeat by the Anglo-Egyptian army under Lord Kitchener at *Omdurman* in 1899.

Since that time Egypt south of Halfa has been controlled by a joint administration of Egypt and Britain, and the advantages of a settled government have already been evidenced in the increase of the products of this region.

Abyssinia and the Eastern Horn of Africa;—

The history of Abyssinia, like that of Egypt, dates far back, and despite invasions by Mohammedan and other peoples the country has been for the most part independent, and ruled over by various local chiefs. The Portuguese in the sixteenth century settled along the coast and even reached to the plateau, while Bruce and other explorers ascended from the Egyptian side to discover the true source of the Blue Nile.

The Italians settled in Eritrea in 1880, and occupied Massuah in 1885 on the withdrawal of an Egyptian garrison. Later they claimed a protectorate over Abyssinia, but after their defeat at *Adowa* in 1896 this claim was withdrawn, and the country has since been an independent kingdom.

In 1868 King Theodore, who had captured some British subjects, was defeated by Britain at *Magdala*, which, being situated on an isolated crag 2000 feet high, is an almost impregnable fortress.

The interior of Somaliland presented an unexplored blank on the map till the close of the nineteenth century. Portugal had earlier explored the coast, and the Sultan of Zanzibar had ports at *Mogdishu* and *Brava*. Before the Mahdist revolt the northern shores of Somaliland formed part of the Egyptian possessions, but with the withdrawal of their troops these lands were transferred to Britain and placed under the Indian Government, and eventually handed over to the Colonial Office in 1886.

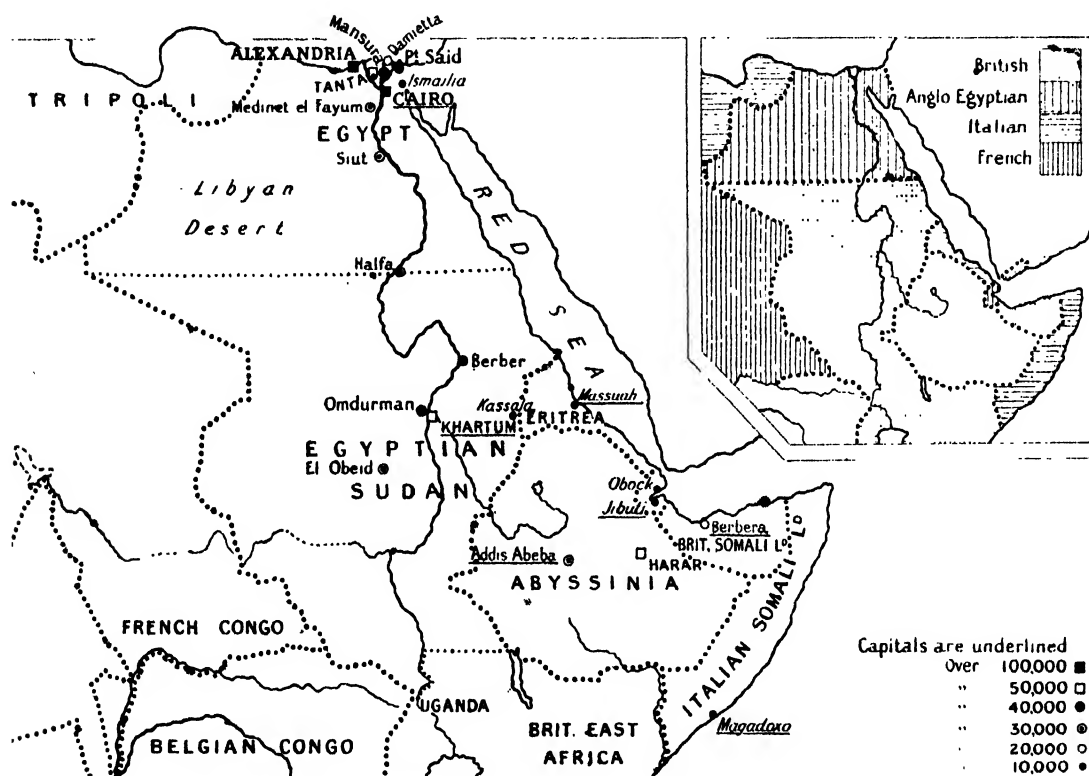
The French first occupied their small colony of *Obock* in 1855, and by several treaties, notably one in 1888 with Britain, its boundaries have been fixed.

Before the Abyssinians defeated Italy in 1896 the remainder of *Somaliland* belonged to the *Italians*, but since then the territory has been limited to a strip of land 180 miles wide bordering the east coast.

the remaining portion being occupied by the Nile Valley.

Although this territory is nominally a protectorate of Turkey, and the Khedive pays an annual subsidy of £720,000 to the Sultan, yet Turkey exerts no control. It has been shown in the history of this region that the finances are under the control of a British adviser. In addition to the Egyptian army, which

Map 15.



NORTH-EAST AFRICA—POLITICAL.

Political Divisions.

Egypt Proper has an area of 400,000 square miles, extending from the Gulf of Akaba in the east to Tripoli in the west, and defined in the south by the parallel which passes through Halfa. It thus includes the mountainous Sinai Peninsula and the deserts on either side of the Nile Valley, the Libyan on the west reaching to the borders of Tripoli and the Tibesti Mountains. Of this area more than nine-tenths consists of desert,

was reorganised by a British General, and in which service is compulsory, the country contributes towards the upkeep of a small British force. The control of both the finance and defence has given Britain the real power in Egypt, although nominally it is not a British possession.

Egyptian Sudan extends southward from Halfa to British Uganda, with the Nile-Congo water-parting separating it from the Belgian and French states on the south-west, and the Nile-Tchad water-parting forming

the border with the French territories on the west.

The government of this state is under the joint administration of Egypt and Britain, a Governor-General being appointed by Egypt with the assent of Britain. The Governors of the thirteen local provinces are British officers of the Egyptian army, or British civil officials of the Government.

The *Enclave of Lado*, already referred to, is controlled by this Government.

Eritrea:—

This Italian colony occupies the coast of the Red Sea roughly between the twelfth and eighteenth parallels of latitude, and extends inland to Abyssinia, but in the north it widens considerably to its north-western border, which divides it from Egyptian Sudan.

Although Massuah is the chief port of this area, yet the seat of government is at *Asmara* on the more healthy plateau.

French Somaliland or Obock:—

This small colony lies between Italian Eritrea and British Somaliland, extending inland to the borders of Abyssinia.

British Somaliland:—

This possession occupies most of the northern coast bordering the Gulf of Aden, and is bounded on the south by Italian Somaliland and Abyssinia. *Berbera* is the chief town, and this and the adjacent ports of *Bulhar* and *Zeila* are protected by garrisons of Indian troops.

Socotra:—

This island is a British possession, and is administered from the important station of Aden on the Asiatic shore.

Italian Somaliland:—

This state borders the east coast from Cape Guardafui to the mouth of the Juba river, extending inland to the boundaries of British Somaliland and Abyssinia. *Mogdishu*, its chief port, is also the seat of government.

EXERCISES.

1. Show the effect of surface conditions upon the history, peoples, and governments of Abyssinia.
2. Name the chief events which led to the Anglo-Egyptian control of the Eastern Sudan. How does the future prosperity of this region depend upon a firm settled government?
3. Draw a sketch map and insert the chief spheres of influence of the European powers who have possessions in the Nile Basin and the Eastern Horn of Africa.
4. Draw any comparisons you can between the distribution of population, rainfall, and vegetation.
5. Egyptian Sudan is a transition region. Prove this statement by references to the surface, climate, vegetation, and races of people of this region.
6. Egypt is nominally a Turkish possession, but really is under British control. Explain this statement, and name the chief events which led to this British control.

AFRICA.

CHAPTER IV.

THE WESTERN SUDAN AND THE GUINEA COAST.

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Gambia, Coast Streams, Kameruns,
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Climate.

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Minerals—Manufactures.

Communications—Commerce.

Distribution of Population—Peoples.

History—Political Divisions.

16. Orographical Map.

17. Transport Route and Production Map.

18. Political Divisions.

Position.

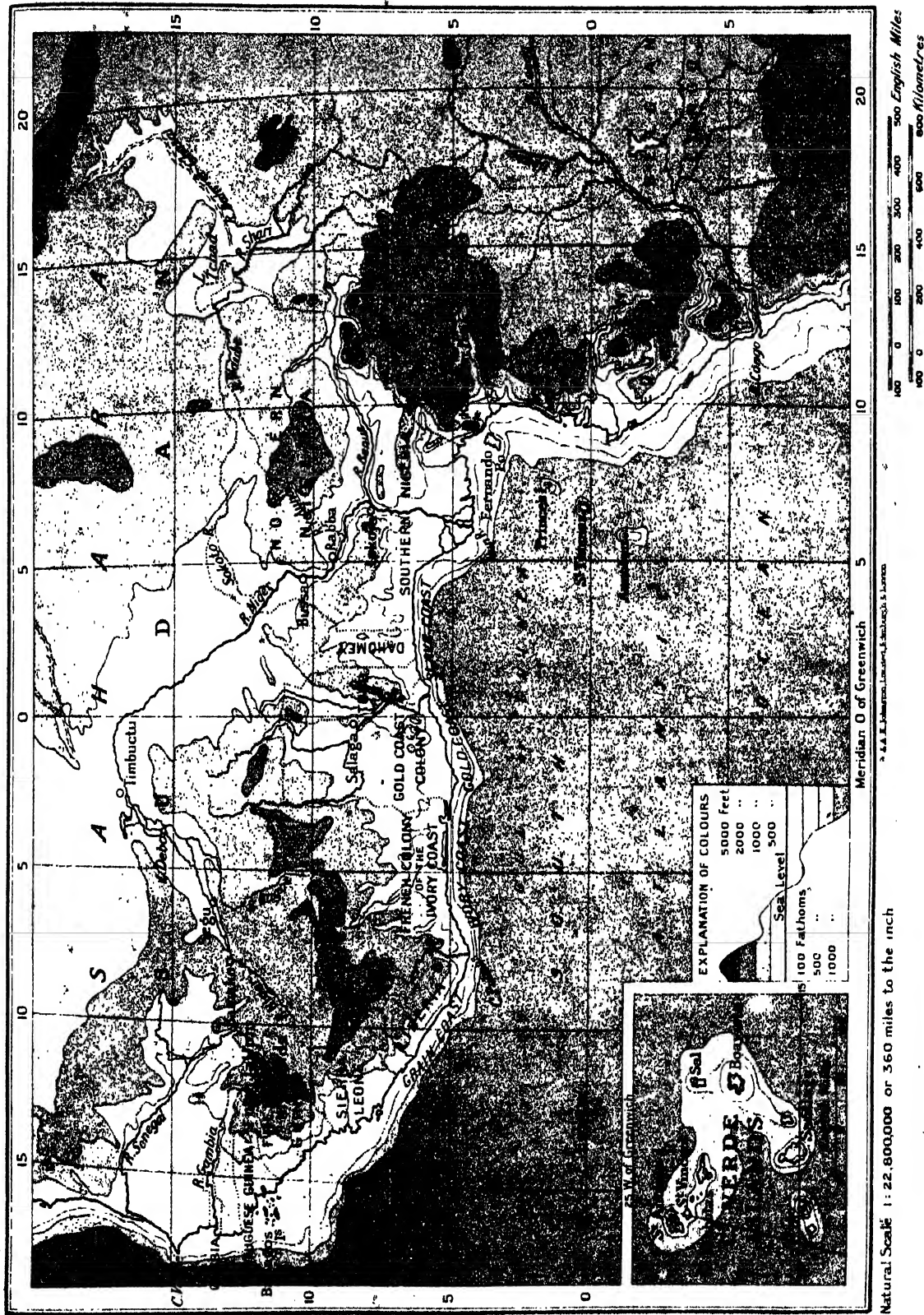
South of the Sahara and north of Equatorial Africa stretches the *Sudan*, "the land of the Blacks." The eastern part of this area, consisting of the middle basin of the Nile, has been described in the preceding chapter. West of that basin the Sudan Plateau can be divided into three drainage systems: (1) the *Lake Tchad* system, (2) the *Niger Basin*, and (3) the drainage of the *Senegal* and *Gambia* to the west coast. These river basins, together with the coastal plain bordering the Guinea Coast, constitute the region to be studied in this chapter. This area, like that of the Middle Nile Basin, is a transition region from equatorial forests to tropical deserts, and the change from the one to the other will be shown not only in the river systems, climate, and vegetation, but also in the races of the people and in their characters and occupations. The effect of tropical plateau and tropical plain will be traced in the contrasts between the climate, vegetation, and peoples of these two areas. *Cape Verde Islands*, situated about 300 miles from the Cape of the same name, and the volcanic islands of *Fernando Po*, *Prince's*, and *St. Thomas*, in the Gulf of Guinea (the latter allied in structure to the mainland), will be included with this region.

Politically the greater part of this area is occupied by France and Britain. *France* occupies the land between Lake Tchad and Egyptian Sudan, the *Upper Niger Basin*, and the *Senegal Basin*, in addition to the coastal provinces of *French Guinea*, the *Ivory Coast*, and *Dahomey*. *Britain* holds (1) the large territory of *Nigeria*, which comprises the lower basin of that river and its tributaries, reaching eastward to include the eastern shore of Lake Tchad; (2) the valley of the *Lower Gambia*; (3) the coastal provinces of *Sierra Leone* and the *Gold Coast*. The remainder of this region is divided between *Germany* (holding *Togoland* and the *Kameruns*), *Portugal* (with the coastal province of *Portuguese Guinea* and the islands of *St. Thomas* and *Prince's* in addition to *Cape Verde Archipelago*), and *Spain* (possessing the island of *Fernando Po* and a small province of *Rio Muni* on the southern borders of this region). *Liberia* forms a small republic founded by the United States of America.

Seas and Coasts.

The coast from Cape Verde to Cape Palmas differs considerably from that extending east of the latter cape to the Niger Delta. The former, exposed to the force of the Atlantic

WESTERN SUDAN AND GUINEA COAST.



Natural Scale 1:22,800,000 or 350 miles to the inch

Meridian 0 of Greenwich

Scale in Miles
0 100 200 300 400 500
Scale in Kilometres
0 100 200 300 400 500

gales, is often known as the Windward Coast, the latter, the Leeward Coast. Between Capes Verde and Palmas there are many indentations, and the map indicates a wide continental shelf area, probably formed of material denuded from the steep plateau edges. Between Cape Verde and the Niger Delta lies a line of sandbanks separated from the shore by shallow lagoons. The eastward sweep of the Guinea Current causes large quantities of sand to be carried here, the sheltering headlands, the almost tideless ocean, and the absence of violent winds, favouring its deposit. Immense masses of vegetation, torn from their banks by rapid torrents, are carried to these sandbanks, and, taking root, help to build the sand into so firm a wall that sometimes the water behind these bars is at a higher level than the outside ocean. The rivers also have brought down much material, utilising it to extend the coast seawards. Old coast-lines can be traced inland, and in some places between them and the new shores exist swamps formed of this material.

Pepper is not now the chief export of the *Grain Coast*, nor are elephants' tusks the product of the *Ivory Coast*. The *Slave Coast* may be of historic interest, but this trade is now abolished, and the other coast which is true to its name is the Gold Coast, which borders a rich auriferous region.

Islands.

The *Cape Verde Group*, consisting of nine islands, is separated from the African shore at Cape Verde by 300 miles, and is of little commercial value except for the important calling port and submarine cable station of *St. Vincent*, on the direct route between Europe and South Africa.

The islands are all rugged and mountainous, consisting of granites and other ancient rocks, with traces of extinct volcanic action. The climate, although tempered by the surrounding sea, is not pleasant. Rain usually falls in the late summer, from August to November, but sometimes droughts occur, causing famine. The scarcity of water and the infertile soil prevent much vegetation. *Cotton* and *indigo* grow wild, and *rice*, *maize*, *coffee*, *sugar*, *millet*, and *tobacco* are cultivated in the valleys, while *cattle* in large numbers are kept.

St. Vincent, situated on an arid rock, has an excellent harbour, consisting of part of an extinct crater. Its shipping amounts to nearly 5,000,000 tons annually.

Fernando Po, *Prince's Island* (Príncipe), and *St. Thomas* (São Thomé), in the Gulf of Guinea, form the western end of a volcanic fault which stretches through the *Kameroons* to the *Adamawa Highlands* in a south-west to north-east direction. These islands, separated from each other by intervals of 120 miles, are therefore continental rather than oceanic islands.

Fernando Po, named after its Portuguese discoverer, is only separated by 18 miles of sheltered water from the mainland. It rises in the centre to an extinct volcanic crater 10,000 feet above sea-level, from the sides of which rivers descend to the coasts on all sides. The island has a heavy rainfall and a temperature modified by the sea, hence it is covered with a dense vegetation which varies with the elevation. *Coffee*, *cotton*, *sugar*, *cocoa*, *maize*, *rice*, *bananas*, *manioc*, and *yams* are grown. Since 1778 it has been a Spanish possession.

Prince's Island and *St. Thomas* are Portuguese possessions. The latter lies on the equator, and has dense, forested coastlands, which rise in the interior to remarkable volcanoes. *Prince's Island* is a fertile rock only 40 miles in area, covered with thick tropical vegetation. Both islands have a heavy rainfall, but the temperature is modified by the sea. The great fertility of the soil causes a large export of *cocoa*, *coffee*, *cinchona*, and *rubber*.

The small *Bissagos* group of islands off the coast of Portuguese Guinea are supposed to be formed of glacial material denuded from the mainland during the Ice Age.

EXERCISES.

1. Draw a sketch map of this region. Name the regions which border it on the land side, and show the proximity of the drainage systems to those of the adjacent regions.
2. Describe the coasts bordering the Gulf of Guinea and account for their formation.
3. Draw any points of comparison or contrast between the climates of the Cape Verde Islands and those of the Gulf of Guinea. Give reasons for your answer.

4. Show how position has made St. Vincent important.
5. How is the structure of Fernando Po and the adjacent islands related to that of the mainland?

Surface.

The *Plateau of Western Sudan* rises gradually from the interior and then descends abruptly to the *Guinea Coast*. The so-called mountains which border this are really the steep edges of the plateau, and rise in the *Futa Jallon Highlands* to their greatest elevation of 4000 feet. From these southern escarpments the land falls in a number of terraces to the coastal plain. Hence the edge of the plateau forms a definite water-parting between long continental rivers, which for much of their course are flowing inland, and short coastal torrents, which descend these terraces to the forested plains bordering the Guinea Coast. Notice on the map that the three large continental rivers, the *Niger*, *Senegal*, and *Gambia*, rise in the Futa Jallon escarpment of the plateau.

The Niger:—

This river, 2600 miles in length, and draining an area of 900,000 square miles (or one quarter the size of Europe) is the third largest river of Africa. Its feeders rise in the Futa Jallon escarpment in *Sierra Leone*, a region of heavy rains, and, owing to the gentle incline of the plateau towards the Sahara, are little obstructed by rapids. Hence shallow river steamers can ascend its upper course as far as *Bamako*. At *Segu* the river enters a broad plain, and, owing to the slight gradient of its bed, develops an inland delta and flows through several channels towards Lake Debo. In this part of its course it receives the *Bagoe* tributary, which drains a large part of the area within the great semi-circular sweep of the main stream.

From its source to *Timbuctu* the Niger flows in a north-easterly direction towards the desert, but at *Timbuctu* it reaches the edge of the Sahara plateau and turns east. Some 250 miles later it is again deflected to the south-east and joined by the *Sokoto*.

Notice that in this part of the river's course it flows through a region approaching almost desert conditions, and consequently receives few tributaries, the only one worthy of mention being the *Sokoto*.

The main stream, flowing to the south-east, cuts through the steep edge of the plateau to reach its mouth, hence between *Bussa* and *Rabba* the river is obstructed by falls which divide the lower from the upper navigation. Between *Rabba* and its confluence with the *Benue*, the river forms a broad, navigable stream, whose depth varies to the extent of 40 feet with the seasonal rainfall.

The *Benue* is a river of even greater value than the main stream. Rising as a mountain torrent in the water-parting which separates it from the drainage to Lake Tchad, it descends to lower levels, and for 600 miles flows as a broad, navigable stream. Many tributaries drain to this stream, and hence, after a course of 850 miles, it reaches the main river at *Lokoja*, with a greater volume of water than the Niger itself.

Below the confluence the combined river flows for a distance of nearly 300 miles, and forms a large delta at the Guinea Coast. This delta has many channels communicating with each other and with the coast lagoons, but of these only the *Nun* is permanently navigable.

As this river flows through country occupied by many different tribes it passes under various names, as do also the Congo and Nile.

The delta of the Niger has an area of 10,000 square miles (or nearly twice that of Yorkshire), and possesses a coastline 200 miles in length. The direction of the winds prevents the sea from scouring its channels, and causes it to deposit large quantities of material between the sandbars and the coast (*see note on Coasts*). Thus new land is being formed seaward.

The Senegal:—

Notice on the map that the upper feeders of the Senegal rise in the Futa Jallon Highlands in close proximity to the sources of the Niger and the Gambia. For the greater part of its 1000-mile course the river forms the boundary of the region of summer rains. North of it no perennial stream reaches the coast until the Atlas Region, which is on the northern border of the Sahara. The Senegal drains an area of 180,000 square miles, and during the wet season sends a great volume of water to the sea.

In the early part of its course the river descends by terraces to its lower navi-

gable course. Hence, although shipping is possible between terrace and terrace, yet continuous navigation is impossible. The volume of water in the river varies considerably from season to season, rising as much as 50 feet during the summer. At the coast a network of small channels form a delta bordered by a strip of sand about 15 miles long and 500 yards broad, behind which lies a coast lagoon.

The Gambia:—

This river, also rising on the steep edge of the plateau, flows west for the greater part of its course of 450 miles. Being navigable for small boats for 300 miles, it forms an important artery for trade with the interior.

The Coast Streams:—

Between the Gambia and the Niger delta the rivers descend from the seaward slopes of the plateau to the coastal plain bordering the Guinea Coast. In their rapid course they tear from forested banks large masses of vegetation, which, on reaching the plain, choke the rivers for several miles. The sandbars already mentioned cause these rivers to flow into shallow lagoons, while the rivers, laden with mud, build deltas and distribute their water into these lagoons by many channels. These lagoons are in many places being silted up, forming mangrove swamps.

Map 16 indicates that the plateau edge approaches closer to the coast in Liberia, and the rivers in this area rise on the continental side of the plateau, but farther east towards the Gold Coast the plateau recedes from the coast. Here the river *Volta*, with its numerous affluents, drains an area of 20,000 square miles, and of its total length of 300 miles two-thirds are navigable, while during the wet season steamers can ascend to within 20 miles of *Salaga*.

The approach to these river mouths is extremely difficult owing to the surf, which is constantly beating against the bars, and ships have to anchor some distance from the shore. Between the sandbars and the coast the lagoons form a navigable waterway for small craft, except where reeds and other vegetation present an obstacle. These channels are however very shallow, and the man-

grove roots and black slime brought by the rivers become exposed at low tide and emit an unhealthy odour.

The Adamawa Highlands and the Kameruns:—

Notice that the political boundary between Nigeria and the German Kamerun territory is formed for a part of its course by the crest of the Adamawa Highlands, and this crest forms the water-parting between the steep slope to the Benue Basin on the north and the more gradual south-western slope to the Gulf of Guinea. Many rivers drain this gradual slope, the chief being the *Sanaga*. All are however obstructed by rapids where they break through a range which has a north and south direction parallel to both the coast and the edge of the plateau. The chief feature of this country is the volcanic *Kamerun* mountain, which rises sheer from the sea to 30,000 feet.

The volcanic mass of the *Kamerun* stands on a base 800 square miles in area, and rises to three terminal peaks known as "The Three Sisters." It consists of lava, scoria, and other volcanic material. The sides are clothed with thick forests to a height of 6000 feet, and these are succeeded by grassy slopes, while the summits consist of bare lavas upon which the snow sometimes settles.

Lake Tchad:—

To the east of the Niger notice the great inland drainage system of Lake Tchad, which can be compared to a spider with long legs, reaching almost to the tributaries of the Niger on the west, the Nile on the east, and the Congo on the south. Bordering it on the north is the Sahara. The Shari drains the higher land, which divides its waters from those of the Welle tributary of the Congo and the Bahr-el-Ghazel tributary of the Nile. The Waube from the west rises in close proximity to the Benue and Kaduna tributaries of the Niger Basin. All the streams which flow to Lake Tchad are intermittent, flowing only during the wet season, and hence both the depth and size of the lake vary much during the wet summer and dry winter seasons.

Lake Tchad itself forms the central portion of a great depression enclosed on all sides by higher lands, and is the remains

of a much larger lake which occupied the whole area when the Sahara was not a desert, but sent copious streams to this depression. The lake is now a shallow lagoon whose sides are bordered with masses of thick reeds, while one-third of its area is occupied by small islands. In summer the surface area of the lake is 20,000 square miles, but this dwindles to half during the dry season.

Rock Structure.

The whole of this region consists of ancient rocks overlaid with limestone, sandstone, and other sedimentary material, from which granite and crystalline schists often crop out as more elevated masses. Between the mouths of the Senegal and Niger the clays and alluvium contain quantities of gold derived from quartz reefs on the edge of the interior plateau. In Senegambia and the Niger Basin there exist large quantities of laterite, a red coloured soil, highly porous, produced by rapid decomposition of the rocks, and owing its tint to the presence of iron.

A great volcanic fault dividing the structure of Southern and Northern Africa stretches from the islands of Fernando Po, St. Thomas, and Prince's, through the adjacent Kameruns to the eastern frontier of Nigeria. Hence the rock structure in this part is largely volcanic.

EXERCISES.

1. Describe the chief surface features of this region. Where is the main water-parting? Name the continental rivers which drain the interior plateau.
2. Describe the upper course of the Niger from its source to Timbuctu. Account for its direction, and for the numerous channels in its course.
3. Describe Lake Tchad and the rivers draining to it. Show how this river system links together three of the largest river basins of Africa.
4. Describe the Niger from Timbuctu to its mouth. Name its chief tributaries, and explain why the lower course of the river is obstructed by falls.
5. Show by a sketch map the connection between the Niger and the adjacent river basins.
6. Describe the streams draining the steep edge of the plateau to the plain. Show

the action of these rivers in building land seawards.

7. Describe the Kamerun, and show how it forms part of a dividing line between North and South Africa.
8. Draw diagrams on squared paper to represent the following areas: British Isles, 121,000 square miles; Niger Basin, 900,000 square miles; Congo Basin, 1,600,000 square miles.
9. Draw on squared paper lines to represent the length of the following rivers: Thames, 215 miles; Niger, 2600 miles; Congo, 3000 miles; and Nile, 3500 miles.

Climate.

This region is a transition area between the equatorial belt of tropical rains and the tropical deserts devoid of rainfall. It has been already shown in Chapter I. that the migration of the sun's vertical rays north of the equator in July causes a belt of high temperature and low pressure north of the equator. Into this low-pressure area winds blow in summer, and, striking the edges of the plateau, cause heavy rainfall along the coastal plain, which gradually decreases towards the desert interior, where the constant dry trade winds are devoid of rain. In winter the migration of the sun's vertical rays south of the equator causes the belt of equatorial rains to shift southward towards the Congo and Zambesi Basins, and the plateau now gets the influence of the dry north-east trade winds. The coastal plains of the Guinea Coast, just north of the equator, have a high temperature and great evaporation, and hence receive rainfall during a greater part of the year, except when the dry *Harmattan winds* blow outwards from the Sahara. They have relatively wetter seasons when the vertical rays of the sun cause an increased evaporation and a consequent increased precipitation.

The coastal plains of Senegal and Gambia are farther removed from the equator, and hence have more healthy climates than the Guinea Coast, while parts of Senegal approaching the Sahara possess a somewhat arid climate.

The contrast between the coastal plain and the plateau is very marked. In the former the rainfall varies between 100 and 160 inches, and the mean temperature from 78° to 86° F. This moist heat

weakens the European constitution and permanent white settlement is impossible. The heavy rains create poisonous fogs over these lowlands, giving rise to ague, while the bites of the mosquitoes who infest these swamps carry the deadly infection of malarial fevers.

On the plateau, however, the conditions become more healthy with the elevation. The seasons here are well defined: (1) a hot, wet season from July to September; (2) the season of the Harmattan (a dry, dust-laden wind blowing outward from the Sahara); and (3) a hot, dry season from February to June. The summer rains, often accompanied by violent thunderstorms, flood large tracts in the lower courses of the rivers and make communication impossible. In this part of the year many streams, such as the Sokoto and Kaduna tributaries of the Niger, and the rivers flowing to Lake Tchad, are mighty streams, but in the dry season their beds form dried water-courses. The north-east trades, which blow over this region, often cause great extremes, and frozen water is sometimes met with in the higher parts of the plateau.

The summer rainfall decreases with distance from the equator until the desert is reached, which is indicated by the direction and diminishing volume of the rivers. The northern bend of the Niger is the northern limit of these summer rains, as also is the Senegal farther west. Notice that both of these rivers rise in the wetter, southern plateau and receive their chief affluents from the south.

EXERCISES.

1. Describe the planetary circulation of the atmosphere. Show its effect upon the climate of this region, and point out any modifications due to local causes.
2. Show the effect of surface features upon the climate of this region.
3. Name the rivers of this region which are intermittent. Give reasons.
4. Explain why the Niger receives few tributaries for a great part of its course, and why its largest and most valuable affluent joins it in its lower course.
5. Western Sudan is a transition region between tropical forest and tropical desert. Give reasons for this statement.
6. In what respects does Western Sudan resemble Egyptian Sudan? Give reason for these points of resemblance.

Flora.

The change from equatorial rains to dry desert conditions has its consequent effect upon the vegetation of this region. The hot, marshy, malarial, coastal plains and the wet, seaward edges of the plateau are covered with tropical forests, from which *palm oil*, *rubber* and *timber* are obtained. The plateau forms a savannah land, in which the varying proportion of woods and pastures depends to a great extent upon the rainfall. In the wetter south are forest lands, but these merge into open woods or park lands, and large areas are covered with tall *prairie grass*. Approaching the desert edge trees disappear almost entirely, and the pasture, which in many parts is capable of supporting large numbers of *horses*, *cattle*, and *goats*, gets poorer, while *acacias* and *thorny scrubs* capable of withstanding drought become common.

On the tropical plains the chief tree is the *oil palm*, whose crushed nut yields oil used in the manufacture of soap and candles. The forests of the Gambia yield a species of *mahogany*, and *ebony* is obtained from the Guinea forests, while numerous creepers supply the coagulated juice which constitutes the *rubber* of commerce. *Banana* plants grow to an enormous size, and *yams* or sweet potatoes and *bread fruit*, the latter obtained from the baobab tree, are native foods.

Ground nuts, which yield oil similar to that of the olive, are an important product of the plain. They are so called because the pods bury themselves under ground to ripen. *Kola nuts*, obtained from trees grown in the southern parts of Sudan, are used in the preparation of a drink similar to coffee.

On the drier lands of the plateau the *oil-palm* disappears and tall *prairie grasses*, sometimes 16 to 20 feet high, are prevalent, the wild *sugar-cane* growing to a height of from 12 to 14 feet. The lower lands bordering the rivers grow *reeds*, *sedges* and *papyrus*, forming, on the banks of Lake Tchad, an unhealthy impenetrable mass of vegetation in which reptiles are prevalent.

Fauna.

The variations in the types of animal life in this region can be compared with the differences in climate and vegetation. The

forests of the coastal plain are the home of animals similar to those found in the Congo forests. *Chimpanzees* and other species of monkeys are prevalent here and also in the forests of the Congo-Tchad water-parting, while large *reptiles* and many kinds of *insects* also abound. The marshy region of Lake Tchad is the home of the *elephant*, *hippopotamus*, and *rhinoceros*, while the two latter, together with the *crocodile*, exist in the lower courses of all the rivers, and in the mangrove swamps of the lagoon coast. The plateau savannahs are the home of many beasts of prey, including *panthers*, *leopards*, *lynxes*, and *jackals*, but *lions* are not so numerous. Many species of the *antelope* family, including the *gazelle*, are to be found, and *buffaloes* roam the pasture lands.

The *ox*, *sheep*, *goat*, *horse*, and *camel* have been introduced into this region, many of them by Arab invaders. The three first named are plentiful in the pastures of the north. Towards the desert edge, where the pasture becomes poorer, the *ostrich* is the chief animal.

The waters of Lake Tchad teem with *fish*, and its marshy swamps are the home of many water birds, such as the *flamingo*, *heron*, and *pelican*.

Cultivated and other Products of Commercial Value.

The tropical forests of the coastal plain yield a valuable export of *palm-oil*, *ground nuts*, *rubber*, *timber*, and *ivory*, but towards the interior *cotton*, *indigo*, *millet*, *maize*, *tobacco*, and *coffee* are grown. *Coffee*, which grows wild, is now cultivated, and produces excellent crops in Liberia. *Cotton* is, however, the most valuable product, and as the climatic and soil conditions are suitable, attempts to encourage its growth are being made, especially by the British in Southern Nigeria.

The more healthy savannah lands of the plateau are largely agricultural. Many of the natives are capable farmers and can in some places produce two crops per year. *Durra* and *sorghum* (two species of millet) are plentifully grown, and provide food for the native population, while *cotton*, *indigo*, *wheat*, *maize*, *tobacco*, and *beans* are also produced in large quantities. These cultivated lands, especially in Northern Nigeria and French Sudan, are capable under European control of producing an increase of raw

cotton and food stuffs for the markets of Europe.

Towards the desert edge the rainfall is insufficient for agriculture, and these lands support *horses* and herds of *cattle*, which are tended by a nomadic Arab population. *Hides* and *leather* form a valuable export of both Northern Nigeria and the French Niger and Senegal territories.

Botanical stations have been established in Southern Nigeria, the Gold Coast, and in the French coastal provinces. *Cocoa* and *cotton cultivation* is being encouraged on the plains, but the difficulty of obtaining steady native labour will always prove a serious drawback.

On the plateau, however, the more civilised natives have for years cultivated the soil, and the district round the city of Kano resembles a garden. These cultivated products have for years found an outlet by the Arab caravans, which carried their products across the desert to the Mediterranean coast. The utilisation of this native labour under wise European control should increase the exports of this area, while the river and rail communications which are being extended to the coast should divert a large proportion of the trade to the British and French ports.

EXERCISES.

1. Describe the climate of this region, and show its influence upon the distribution of vegetation.
2. Name the chief cultivated products grown in the Niger Basin. Show in what ways the future development of this region will be of importance to Britain.
3. Draw a contrast between the surface, river drainage, climate and products of the plateau, and those of the coastal plain.
4. What resemblances can you trace between the distribution of rainfall, vegetation, and animals of this region?
5. Name the chief products of the coastal plain. What is the value of each to the commercial and manufacturing regions of the world?
6. Explain why the plateau of Western Sudan is more capable of development than the Guinea Coastal Plain.
7. Draw a comparison between the products of Western and Egyptian Sudan, giving reasons for any points of resemblance.

Minerals.

The whole of the west coast is *gold-bearing*, and the alluvium carried down to the shores of *Axim* gave the name of *Gold Coast* to this region. These gold-producing lands extend from the Gambia to the Niger, and inland exist as rich reefs, which are now being worked by British and French companies. Rich supplies of *tin ore* and *galena* (yielding a fair return of *silver*) are found in Northern Nigeria, and there are also deposits of *lignite*, *manganese* and other minerals in Southern Nigeria. The whole of West Africa is rich in *iron ore*, and deposits of *copper* are also found. The marked absence of coal will prevent any large manufacturing development of this region, while the absence of salt causes a large salt trade with the Sahara.

Although all the states from French Guinea to the Ivory Coast obtain *gold* from river alluvium, the chief reefs are being worked in the *Futa Jallon Highlands*. The total yield from the Gold Coast since European occupation in the fifteenth century reaches to nearly £700,000,000, and this gold output is now obtained both from quartz and alluvium. The gold from this coast gave its name to our guinea.

Natives of Northern Nigeria have worked the *iron*, *lead* and *tin* for centuries, but rich alluvial deposits of *tin* are now being worked in the districts of Kano and Zaria. This tin-bearing area extends over 9000 square miles, and, with the development of the mines, this mineral is likely to become one of the most valuable exports.

The natives obtain *silver* and *lead* from the rich reefs of *galena* in Northern Nigeria, while pockets of silver have also been found in some parts.

Manufactures.

Although the gold, tin, and other ores are being developed by British, French, and other European Powers, this region, owing to the absence of coal, can never resolve itself into a manufacturing area, and its chief commercial value will always lie in the export of raw materials and food stuffs for the markets of Europe.

For centuries, however, the natives of the plateau, who have reached a comparatively advanced stage in both arts and civilisation, have manufactured large quantities of blue cotton cloth (made

from the locally grown cotton and indigo), which has found a market not only in Central Africa and the Upper Nile, but on the Atlantic and Mediterranean coasts. These Sudan tribes are also far famed as blacksmiths, and are expert workers in brass, silver, and gold, as well as in leather and glass, whilst they exhibit remarkable skill in the making of canoes.

Communications.

The unhealthy, tropical, coastal plains, the obstructions in the rivers which drain through it from the edge of the plateau, and the treachery and savage nature of the inhabitants are serious obstacles which have prevented the full development of the rich interior plateau. So great did these obstacles prove in the past, that nearly all the products were taken by Arab traders from the route centres on the desert edge to the Mediterranean coast. The shortest journey across the Sahara takes three months, but this slow and expensive method was preferable to facing the obstacles of export to the Guinea coast, and much of the produce still finds an outlet *via* the desert to the shores of Tripoli, where Italians do a great trade with the Arab caravans.

The future of this region depends largely upon those European Powers who hold the coast lands and the difficult hinterland behind them. Railways from the chief ports on the coast are being pushed inland to the interior, and these, together with the river navigation of the Lower Niger and its tributary the Benue by British steamboats, and that of the Upper Niger and the Senegal by French steamers, are now bringing much of the produce to the coast.

River Navigation :—

Notice on the Transparent Route and Production Maps those parts of the rivers which are marked with a thicker line to indicate the possibility of navigation. British steamers utilise the *Lower Niger* from the delta to *Rabba*, where the falls prevent farther progress, while the *Benue* tributary has 600 miles of navigation used in conveying the products of the Adamawa country to the coast. Between *Rabba* and *Bussa*, on the main stream, navigation is impossible, but above the latter town there is communication along the *Upper Niger* as far as *Bamako*.

The *Senegal* is navigable to *Kayes* during the wet season, and the *Gambia* from *Bathurst* to the interior border of British territory. All the rivers draining to the coast from the edge of the plateau are navigable in their lower courses across the plain, but only that of the *Volta* is sufficiently long to be of much service.

Railways :—

Kayes, at the limit of navigation of the *Senegal*, is connected to *Koulikoro* on the navigable Upper Niger, while a projected railway route from *Kayes* to the port of *Dakar* is under construction. *St. Louis* and *Dakar* are connected by rail. From *Konakry*, on the French Guinea coast, a road has been constructed inland to the Upper Niger, and this is followed by a railway which has already reached as far as *Karussa*. These railway and road connections link the river navigations, and provide outlets for the products of the French Niger territories to the ports of *St. Louis*, *Dakar* and *Konakry*.

In *Nigeria* a railway from *Lagos* is carried through *Ibadan* and across the Niger to *Zungeru*, where it joins another which runs from the Niger in a north-eastward direction to *Kano*. These railways are of very great importance. The rich products of Northern *Nigeria*, cut off by falls from the navigation of the Niger, found an outlet *via Kano* across the Sahara to the shores of *Tripoli*. It is anticipated that the construction of this railway will divert this trade through British territory, and by providing an outlet for the cotton of *Kano*, will assist in supplying Britain's demand for raw material.

Another route is now projected from Port *Harcourt* at the mouth of the *Bonny* River to the tin mines of Northern *Nigeria*, where it will probably connect with the existing lines.

Numerous less important railways lead from the ports on the coast to the richer lands of the interior. Many of these are taking the place of roads already constructed. Trace on your map these routes, and notice especially the British railways which run from *Freetown* through *Sierra Leone* for 200 miles to *Batima* on the *Liberian* border, and from *Sekondi* on the *Gold Coast* to *Kumasi* the capital of *Ashanti*. The French have railways leading inland in all their coastal provinces, as also have Germany in their

coastal provinces of *Togoland* and the *Kameruns*.

As the *Gambia* is navigable throughout British territory, railways are unnecessary, and both here and also in *Portuguese Guinea* and the independent province of *Liberia* are conspicuous by their absence.

Native Trade Routes :—

Much of the native trade on the rivers is done by means of canoes, in the navigation of which the natives are very skilful. On land, goods are carried by caravans of human porters, while the trade routes in most cases are beaten tracks, running for the greater part in an east and west direction, and either following the forest edge *via* the important trade centres of *Kong*, *Salaga*, and *Ilorin*, or else along the desert edge to the important towns of *Timbuctu*, *Kano*, and *Sokoto*. From these centres many caravan routes lead northward across the Sahara, and until the present century nearly all the trade of the plateau found an outlet this way.

Notice on the north of the map routes leading northward from *Kano* to *Tripoli*, from *Lake Tihad* to *Tripoli* and *Egypt*, from *Sokoto* to *Tunis* and *Tripoli*, and from *Timbuctu* to *Morocco*, *Algeria*, *Tunis*, and *Tripoli*.

Commerce—Seaports and Trade Centres.

The control of the great waterways of the plateau, and the railway connections between them, give Britain and France the largest shares in the commerce of this region. The trade of Britain finds an outlet through the ports of *Nigeria*, while a great part of the French export is taken out through *Senegal*. Britain and France share with Germany the chief trade of the coastal plains, Spain and Portugal taking a comparatively unimportant part.

British Possessions :—

Northern and Southern Nigeria.—The trade of these states doubles in value that of the other British West African possessions. The exports include *palm-oil*, *rubber*, and *ivory* from the coastal plains, and *coffee*, *cotton*, and *cereals* from the plateau. *Lagos*, to the west of the delta, is the most important port. *Forcados* and *Akassa* are the two chief ports of the delta, and *Calabar*, on the estuary of the *Cross River*, is the outlet for the eastern provinces.

Inland there are important trade centres in Northern Nigeria from which caravans carry the products of the interior plateau northward across the desert. Of these *Kano*, *Sokoto*, *Gando*, *Katsina*, and *Kuka* are the chief. The remaining trade centres are either connected with the river navigation of the Niger and Benue or else with the railways, *Bussa*, *Jebba*, *Rabba*, *Lokoja*, *Iddah*, and *Yola* being important centres from which products are sent down the river, while *Bida*, *Zungeru*, and *Zaria* in Northern Nigeria, and *Ibadan* and *Abeokuta* in Southern Nigeria, are important railway centres.

Lagos, on an island near the western boundary of Southern Nigeria, has under construction harbour works which will allow of vessels entering at all times, and the completion of these, together with the railway which has been carried northward to *Kano*, will render it the chief port of the state.

Abeokuta and *Ibadan* are the chief centres of the provinces west of the river, and the railway northward from *Lagos* passes through these towns to *Jebba* on the river, while *Bida*, *Zungeru*, and *Zaria* are on the route northward to *Kano*.

Sokoto, *Gando*, *Katsina*, *Kuka*, and *Kano* are important and populous native centres, which during the past have had trade connections with the Mediterranean, but the railway route from *Kano* should divert this trade southward to the coast. *Kuka*, in the far east, is the chief British outlet of the Lake Tchad region.

Bussa and *Rabba* are on either side of the waterfalls which obstruct the river navigation. *Lokoja* is at the confluence of the Benue and the Niger, *Yola* is the route centre of the upper navigation of the Benue, and *Iddah* is a river port on the borders of Northern and Southern Nigeria.

Ilorin, to the west of the river, is a native trade centre connected with the east and west route, following the borders of the tropical forest through *Kong* and *Salaga*.

The Gold Coast.—The chief exports of this region are the products of the tropical forests, *palm-oil*, *kernel*s, *rubber*, and *gum-copal*, with an increasing export of *hard timber*, but the increase in plantations is creating a large export of *cocoa*. *Gold*, mostly obtained from alluvium, has always been important, and

the working of the reefs under British control will probably result in an increased output in the future.

Accra, the capital, *Elmina*, *Cape Coast Castle*, and *Axim* are important ports, while the railway from *Sekondi* to the interior will tend to increase the trade of that town. *Kumasi*, the capital of Ashanti, is the chief trade centre of that state, and *Salaga*, farther north on the Volta, is a native trade centre connected by caravan routes to *Ilorin* on the east and *Kong* on the west.

Sierra Leone.—The trade of this British possession consists largely in exporting such produce of the tropical plain as *palm-oil*, *kola-nuts*, *gum-copal*, *oil-seeds*, and *ginger*. *Hides* are also exported and a few *cattle*.

Freetown, the capital of this state, at the mouth of the *Rokelle River*, has the best harbour on this coast. It is an important Imperial coaling station, strongly fortified, and the headquarters of British forces in West Africa. Inland there are few towns of importance, *Batima*, on the Liberian border and the terminus of a railway from *Freetown*, being the chief.

British Gambia.—This state, which includes the lower navigable portion of the Gambia River, exports chiefly *ground nuts*, *bees-wax*, *hides*, *millet*, and *cotton goods* woven and dyed by the natives.

Bathurst, on an island at the mouth of the river, is the only important town, and most of the trade with the interior is carried on by means of river communications.

French Possessions:—

Senegal and Niger Territories.—Notice on the map that the greater part of the interior plateau is under French control, with outlets to the coast in Senegal, French Guinea, the Ivory Coast, and Dahomey. The long upper navigation of the Niger to *Bamako*, and the railway connection between *Koulikoro* and *Kayes*, cause many of the products of the interior to find an outlet *via St Louis*, at the mouth of the Senegal, and *Dakar*, under the shelter of Cape Verd. The chief exports of this region are *ground nuts*, *cattle*, *rubber*, *skins*, and *wool*, and the trade centres, in addition to *Kayes*, *Koulikoro*, and *Bamako* already mentioned, are *Segu*, *Timbuctu*, and

Ilo, the latter on the Northern Nigerian border.

St. Louis, at the mouth of the Senegal, is, owing to the shifting nature of the river channels, not such a noted port as *Dakar*, where important harbour works are now being constructed. The two towns are connected by rail.

Timbuctu, near the northern bend of the Niger, is, like Kano and Sokoto, a starting place for caravan routes across the Sahara.

Segu is an important river port situated where the river Niger enters a broad laterite plain, and flows north-east in many channels before it reaches Timbuctu.

French Guinea, which extends from the plateau to the coast, exports much of the produce of the interior plateau. A road and a railway to connect its chief port of *Konakry* to the navigable Upper Niger are now in course of construction. The chief exports are *rubber*, *palm-kernels*, and *ground nuts* from the tropical plain, *cattle* from the Futa Jallon Highlands, *gold* from the alluvial deposits and quartz reefs, and *coffee*.

Konakry is the only important port, the surf-beaten coast, the marshy lagoons, and unhealthy swamps making the whole coast difficult of access.

French Ivory Coast.—The chief products of this province are *coffee*, *rubber*, *coco-nuts*, and *timber*, especially *mahogany*. These are exported from *Bingerville* and *Bassam*, the two chief ports. Inland there are few centres of importance. *Kong* is a large native trading centre on the route westward through Salaga.

Dahomey.—The chief ports of this coast are *Porto Novo* and *Whydah*, and these export the produce of a large hinterland. These include *maize*, *palm-oil*, *copra*, and *rubber*.

Lake Tchad Territories.—*Gums*, *millet*, and *ivory* are the chief products of this region, and these find an outlet either by caravan routes across the Sahara to Tripoli, or westward to French Sudan, or southward *via* the routes of French Equatorial Africa.

German Possessions :—

The products of *Togoland* are similar to those of the other coastal provinces, and the chief exports are *palm-oil* and *kernels*,

cotton and *maize*, while cultivated plantations are increasing the export of *cocoa* and *coffee*. The harbourless, surf-beaten coast makes landing difficult. The chief inland trade centre is *Bismarckburg*.

The Kamerun Colony.—The exports are *palm-oil*, *rubber*, and *ivory* from the forests, *cocoa*, *coffee*, and *spices* from the plantations, while *cattle* rearing has proved so successful that it promises in future to become a large export. *Duala* and *Victoria* are the two chief ports.

Liberia :—

This state, being largely undeveloped, has practically no commerce. *Monrovia* is the chief port, and sends out the *tropical forest produce* and the *cocoa*, *coffee*, and *ginger* which are cultivated in the interior.

Portuguese and Spanish Possessions :—

Portuguese Guinea exports little except the *tropical forest productions*, but the islands of *St. Thomas* and *Prince's* send to Britain and other parts of Europe large quantities of *cocoa*, *coffee*, *rubber*, and *cinchona*, and these same products are exported from the Spanish island of *Fernando Po*.

EXERCISES.

1. Draw a sketch map of this region. Insert the navigable rivers and the railways which connect their navigable courses.
2. What are the natural obstacles to the development of this region? Show how these obstacles determined the direction of natural routes.
3. Describe the chief means of communication in the British and French possessions of this region. Show that the value of these communications gives these two countries the greatest share in its commercial development.
4. Name the chief minerals found in the Western Sudan and the localities in which they are found. Explain why there is little possibility of this becoming a manufacturing area.
5. Describe the position of three of the most important seaports of this region. Show their communications with the interior, and the products which they will export.
6. Show to what extent the future development of this region is dependent upon European control.

Population.

A comparison between the vegetation and population exhibits the interdependence of the one on the other. The tropical coastal plains have a dense population, decreasing gradually towards the desert, where the inhabitants become very scattered. In the rich agricultural regions of Northern Nigeria there are large native populations and several towns of importance, Kano having a population of 70,000, while Bauchi, in a rich mining and agricultural district in the higher lands

backward degraded type, and professing pagan forms of religion.

The Mohammedans of the plateau drove the weaker Negro races to the coastal plains, where the ill effects of climate, and the degrading example of slave traders, caused them to sink still lower in the social scale. These pagans, some of whom are cannibals, but all savage and treacherous by nature, present a great drawback to the development of the plain. It is almost impossible to obtain the steady native labour so essential in

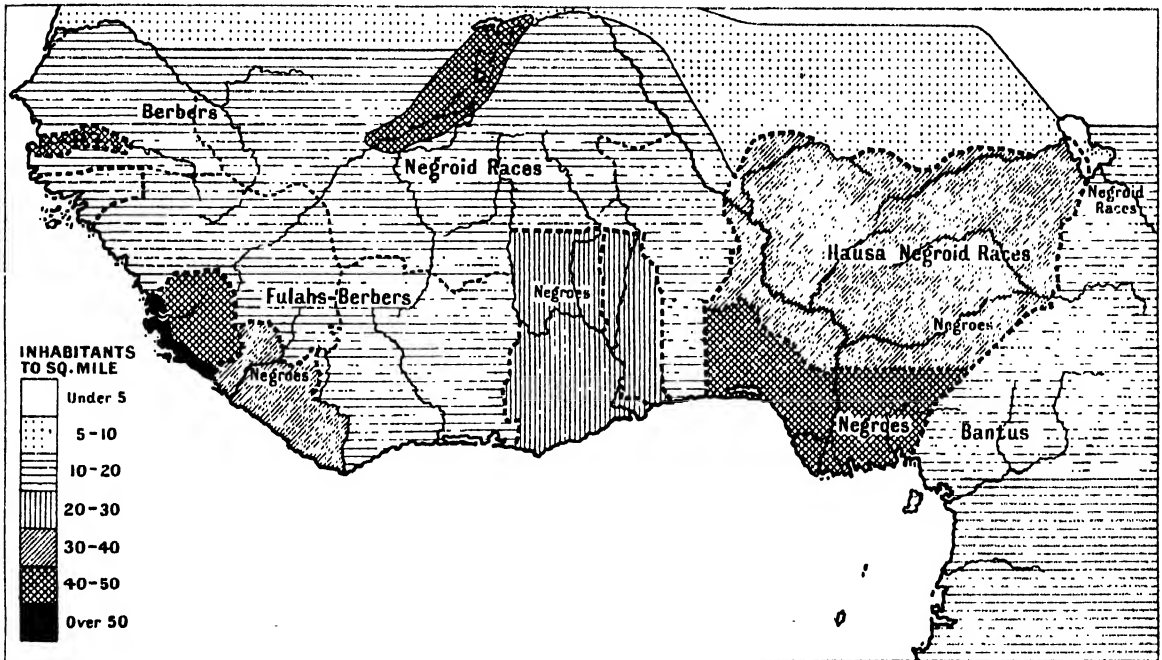


Fig. 9. --West Africa, Population.

north of the Benue Basin, has a population of 100,000.

People.

The *Arab* people, predominating in Egyptian Sudan, decrease gradually towards the west, until they exist only as the caravan traders of the desert. Their place is filled by *Berber* invaders of the white race from the north. Many of these have intermarried with the negroes, and the resulting population of the plateau is a *Negroid* mixed race. The Arabs, Berbers, and Negroids all profess Mohammedanism. The coastal plains are inhabited by pure *Negroes*, mostly of a

this area, where, owing to the unhealthy climate, the white man cannot live.

Upon the *Negroid* races of the plateau much of the future of this region depends. They are an industrious and peaceful people, reaching in some respects a high state of civilisation, and under European control are likely to prove valuable assistants in developing the resources of their country. The *Hausa*, one of the most highly cultivated of these races, are skilful husbandmen, clever workers in leather and metal, and weavers of cotton cloth, while Hausa merchants are clever traders, who convey their wares to Egyptian Sudan, Central Africa and the Mediterranean. Many of these people

live in large towns which are surrounded by fertile districts in a high state of cultivation.

The white people, chiefly nomadic shepherds, belong to the Caucasian race, and exhibit the features of this type, although their complexions are nearly as dark as those of the Negro. The Arab Mohammedan slave and ivory trader has been in the past a great obstacle to the country's development.

The boundary between the Niger territories and the German Kameruns is the dividing line between the Negro and Bantu races. In the German colony the Bantus form the bulk of the population, although in the far north-east the people are closely related to the Negroes of the Niam Niam country.

History.

The present distribution of peoples point to an invasion by the white races (chiefly Berbers) from the north. These conquered many of the native Negro races and drove the weakest of them to the plain. The Berbers and Arabs are responsible for the spread of the Mohammedan religion on the plateau.

Although French traders in search of gold and slaves landed on the shores of *Senegal* in the fourteenth century, and both this state and that of *French Guinea* had long been French possessions, it was not until the close of the nineteenth century that France developed the interior with the object of controlling the western plateau. Towards the close of last century a series of successful expeditions against the native chiefs gained for the French the control of the *Upper Niger* to Timbuctu, and this new territory, added to their original possessions, gave them a large share in the control of this region. In 1884 they secured rights to the *Ivory Coast* and to a large hinterland reaching to the French Sudan, while in 1902, after the defeat of the native rulers, *Dahomey* was added to their possessions.

Britain settled along the *Gambia Coast* in Queen Elizabeth's reign, and the *Gold Coast* became a British possession in the seventeenth century. *Sierra Leone* at the close of the eighteenth century, and *Lagos* in 1860, were taken with a view to stopping the slave traffic, while the *Niger Coast Protectorate* did not become British until 1888, and then only with

the object of protecting our trade interests in this region against Germany and France. Since then numerous peaceful treaties made with the native chiefs gave Britain a protectorate over the *Yoruba* country west of the Niger River.

The development of *Northern* and a large part of *Southern Nigeria* is due to the *Royal Niger Company*, to whom a charter was granted in 1886. This company not only made many treaties with the native chiefs, by which they increased our territory eastward to the shores of Lake Tchad, but also opened up the trade resources of the country. Their charter was revoked in 1900, and this large territory now forms *British Northern* and *Southern Nigeria*, the latter including the *Yoruba* land west of the river and the island port of *Lagos*.

Ashanti was added to the *Gold Coast Colony* in 1874, when a British force defeated the formidable native army of that state.

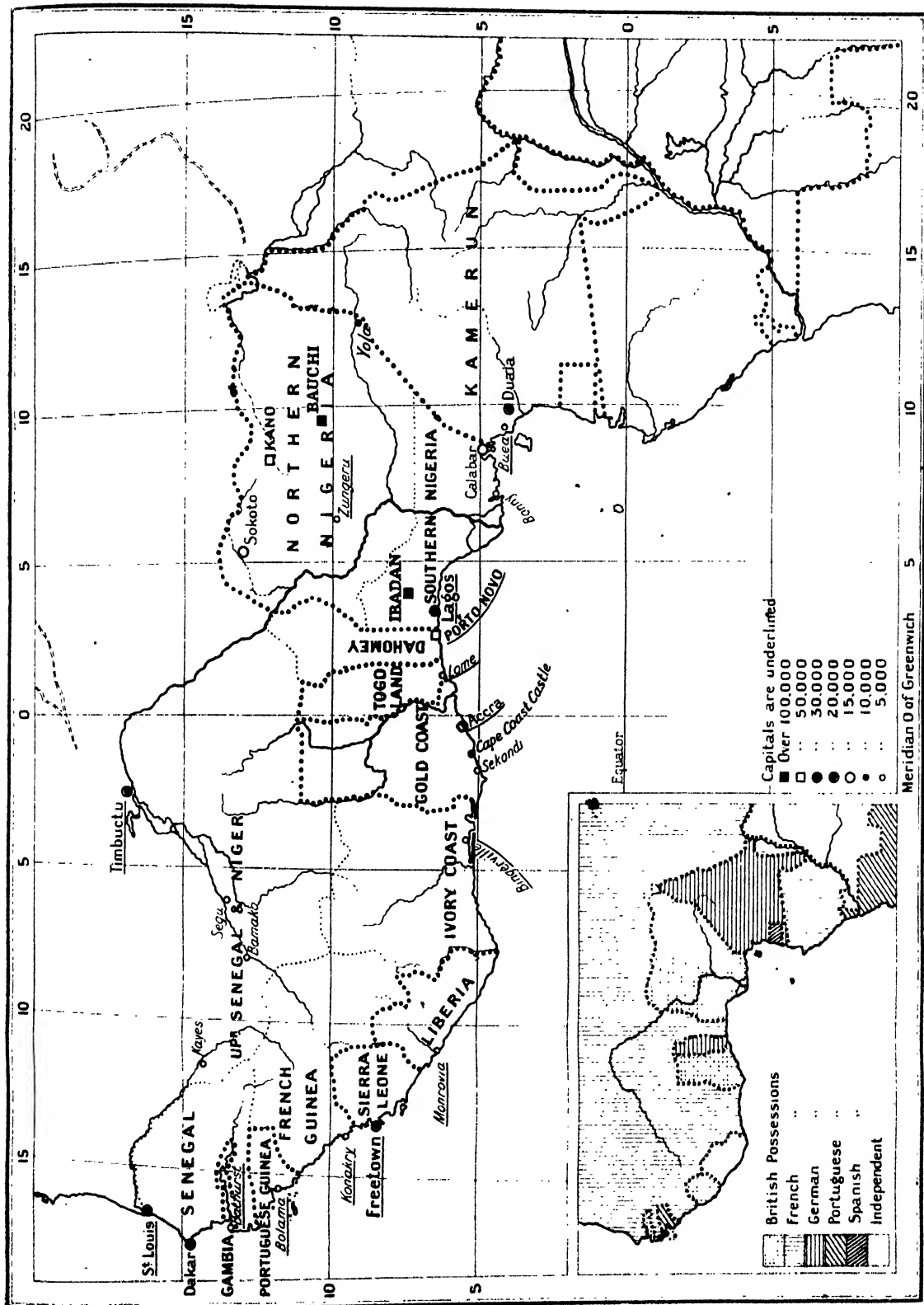
Germany has held the thriving little colony of *Togoland* since 1884, but until 1885 the *Kamerun* colony was looked upon as a British Protectorate. In that year German traders settled along the coast, and by an Anglo-German Agreement Britain ceded her rights to the colony. Since that time, although Germany has established plantations near the coast and made many explorations into the interior, the greater part of the country still remains unexplored and controlled by native chiefs.

In this region, as in the remainder of Africa, the *Portuguese* were the first explorers, but their original possessions have decreased in size and importance, until to-day they only include the small and unproductive colony of *Portuguese Guinea* and the islands of *St. Thomas* and *Prince's*.

Liberia, as suggested by its name, was a state formed by Americans where freed slaves could return after the abolition of slavery. Founded upon the republican model of the United States, it has failed to reach the expectations of its founders, and it is now in the most backward condition of any of the West African colonies.

Political Divisions.

A study of Map 18 will show the value of the French possessions in this region. Notice how British Gambia and Portuguese



WEST AFRICA—POLITICAL.

Guinea, and farther south Sierra Leone and Liberia, are hemmed in on all sides, except that facing the sea, by French territory. Farther to the east the British Gold Coast colony and German Togoland are shut in in a similar manner, while French territory borders Nigeria on the west and the north, and French Congo reaches north to include the eastern shores of Lake Tchad.

Originally the provinces bordering the Gulf of Guinea were merely coast stations situated where some river caused an outlet for the produce of the interior, while the hinterland was largely ruled over by native chiefs. Large areas in unhealthy regions such as these must still be controlled by natives, but the development of roads and railways to tap the resources of the interior is carrying European influence farther inland, and the power of native chiefs has been curtailed.

British Territories :—

Northern Nigeria is now divided into thirteen provinces, each controlled by a resident official who superintends the government by the native chiefs. The whole is under the control of a Governor appointed by the Colonial Office. *Zungeru*, having the healthiest position in this area, is the seat of government.

Southern Nigeria reaches from French Dahomey to the German Kamerun colony. It is divided into three provinces, the western one including *Lagos*, which is the seat of government.

The Gold Coast has 334 miles of coast-line between the Ivory Coast and Togoland. Ashanti and a great part of the northern territories are ruled over by natives, but resident officials see that order is kept.

Sierra Leone proper consists only of the coastal land, but there is a protectorate over the interior portions. The seat of government is *Freetown*, one of the most important towns in West Africa.

Gambia, occupying the lands on either side of the navigable part of that river, consists of a colony of 4 miles ruled over by a Governor. The remainder forms a protectorate ruled over by native chiefs under the control of the Governor. *Bathurst* is the seat of government.

French Territories :—

Senegal consists of a small area near the coast under direct administration, and a

much larger area over which the French hold a protectorate. Its capital is *St. Louis*, and *Dakar* is a fortified naval station.

French Guinea, between Portuguese territory and Sierra Leone, extends inland to the French Sudan colony, having an area of 95,000 square miles. *Konakry*, the chief port, from which a railway is carried to the Niger, is also the seat of government.

The *Ivory Coast*, between Liberia and the Gold Coast, is a large province in which native chiefs exert a large amount of control. *Bingerville* is the seat of government.

Dahomey, although only possessing 70 miles of coast, opens out towards the interior and forms a large state. The seat of government is *Porto Novo*.

The *Upper Senegal and Niger Territories* consist of the whole of the land lying behind the coastal provinces, and extending as far as the Sahara border. They thus form a vast protectorate stretching from the Senegal and Gambia westward, and including the whole upper course of the Niger, and extend north of Nigeria to Lake Tchad, where they meet the northern boundaries of French Equatorial Africa.

German Territories :—

In Chapter II. reference was made to the extension of the *Kamerun colony* westward, and southward to the Congo River. This additional area was ceded by the French to the Germans in 1911. Notice that this colony occupies the coast, while its northern border reaches inland to the southern shores of Lake Tchad, where its boundaries meet those of Britain to the west and France to the east. The seat of government is at *Buea*.

Although German Togoland has a coast-line of only 32 miles between the British Gold Coast colony and French Dahomey, it has an area of over 32,000 square miles. Its seat of government is *Lome* on the coast.

Portuguese Possessions :—

Portuguese Guinea is a small province on the Senegambian coast, with its capital and chief port situated on the island of *Bolama*.

The islands of *St. Thomas* and *Prince's* are Portuguese, as also are the *Cape Verd Islands*.

Spanish Possessions :—

The small state of *Rio Muni*, between the Kameruns and the French Congo, and the islands of *Fernando Po* and *Annobon* are the only Spanish possessions in this region.

Liberia :—

This state is a free and independent republic based upon the model of the United States, but with each elector of Negro blood. *Monrovia* is its capital.

EXERCISES.

1. Show any relationship between the distribution of populations and that of rainfall and vegetation.
2. Show how the distribution of races in Western Sudan has been determined by natural conditions. Show how the future development of the plateau may be assisted by the native populations, while the inhabitants of the coastal plain are likely to hinder progress.
3. Where would you fix the boundary between Northern and Southern Africa? Give reasons for the boundary you choose.
4. Draw any points of comparison and contrast between the distribution of races in Western and Egyptian Sudan.
5. Describe the people who inhabit the Guinea Coastal Plain. State any geographical or political reasons which account for their backward condition.
6. Define the term "Hinterland," with special reference to the European ports on the Guinea Coast.

AFRICA.

CHAPTER V.

THE ATLAS REGION AND THE SAHARA.

CONTENTS.

Position.
Seas and Coasts—Islands.
Surface: Atlas Region Structure and Rivers.
" Sahara and Tripoli.
Climate.
Flora—Fauna—Minerals.
Products of Commercial Value—Manufactures.
Routes: Railways and Caravan Routes.
Commerce, Seaports, Trade Centres.
Density of Population—Peoples.
History—Political Divisions.

MAPS.

19. Orographical Map of Atlas Region and Sahara.
20. Transparent Route and Production Map.
21. Map showing Political Divisions and Chief Centres of Population.

Position.

In the far north-west of the continent is a rectangular mountain mass allied in structure to the surface features of South-West Europe, and separated from the true African continent by the almost uncrossable barrier of the Sahara. The close connection between this Atlas Region and Europe is seen not only in the relation of its structure, but also in its climate, productions, and peoples.

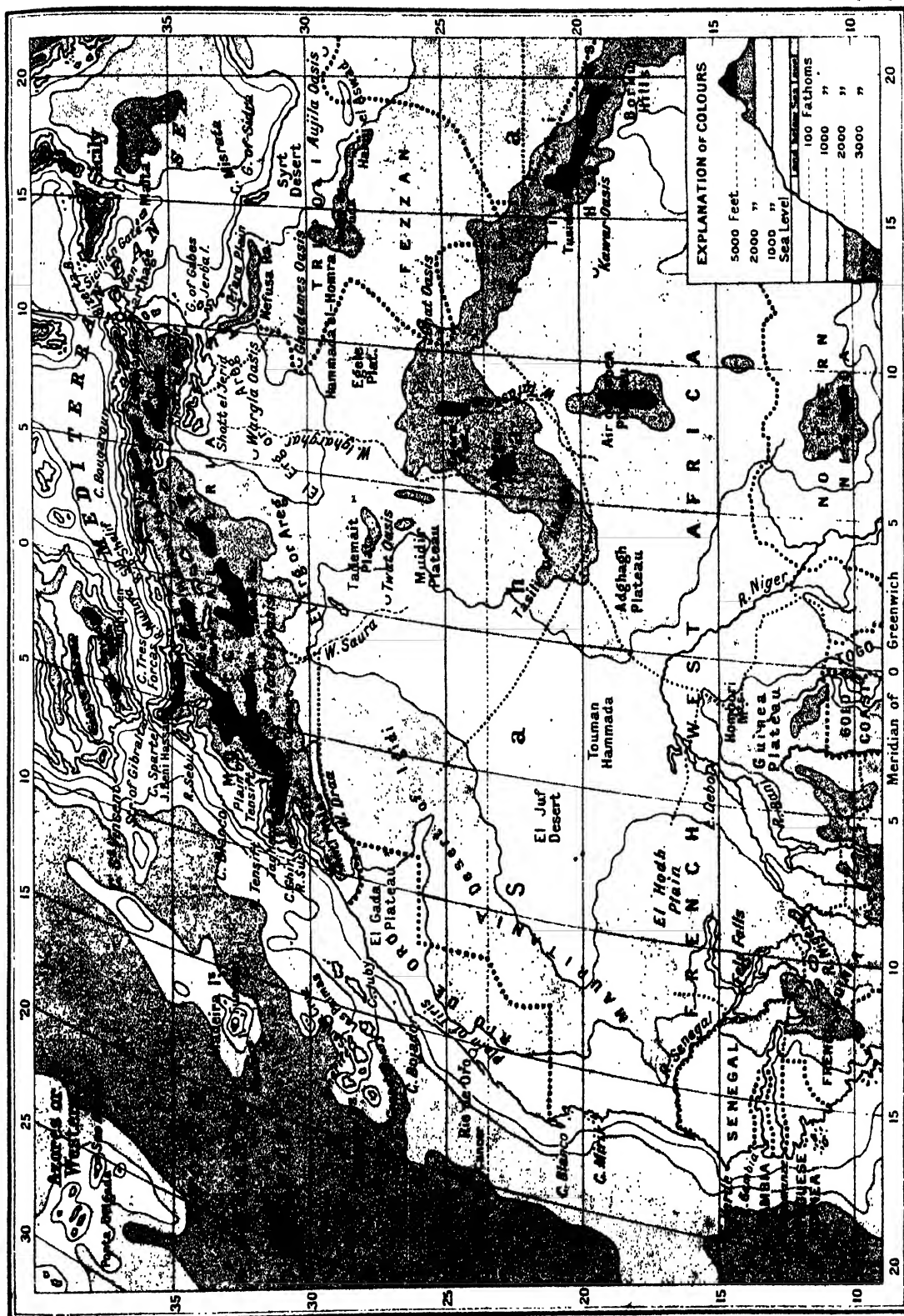
The mountain mass, stretching in a north-east direction from Cape Juby to Cape Bon, has an average width of 200 miles, and a total area of 450,000 square miles. To the early Arab geographers it was the "Western Island," bordered on three sides by the sea, and on the south descending to a sea of sand known as the Sahara.

The Sahara really extends from the shores of the Red Sea to the Atlantic coast, but the Nile, created by external climatic conditions, causes the more eastern part to be connected with Egypt. Desert conditions reach the coast between Cape Ghir and the Senegal mouth, and border the Mediterranean between the Atlas Region and the Nile. Hence the semi-desert state of Tripoli

bordering the Mediterranean shores will be included with the Sahara.

In the first chapter it was shown that the folded Sierra Nevada range, which ended in the rock of Gibraltar, was continued on the other side of the narrow strait through Cape Spartel and the Er Rif Mountains to the Atlas system, and similarly that the eastern end of this mountain system in Cape Bon was continued across the Sicilian Strait to the mountain systems of Sicily and Italy. Politically the Atlas Region is divided into Morocco, Algeria, and Tunis, all now under French control. Morocco, which occupies about half the area, was until 1911 an independent sultanate, but Algeria has been a French colony since 1834 and Tunis a French protectorate for over thirty years.

The Sahara Desert, with an area of 2,250,000 square miles, extends from the Atlas Region and the Mediterranean shores to the Niger Basin, and forms part of a great belt of deserts stretching from the Pacific through Asia and Africa to the Atlantic. With the exception of the eastern portion, known as the Libyan and Arabian Deserts (which form part of Egypt, and have already been studied



EXPLANATION OF COLOURS

5000 Feet	100 Fathoms
2000 Feet	1000 Feet
1000 Feet	2000 Feet
Sea Level	3000 Feet

Scale: 1:23,700,000 or 375 miles to the inch

Natural Scale 1:23,700,000 or 375 miles to the inch

Scale: 1:23,700,000 or 375 miles to the inch

Natural Scale 1:23,700,000 or 375 miles to the inch

with that region), and the small Spanish coastal province opposite the Canary Islands, the remainder is under French control.

The semi-desert state of Tripoli, through which many caravan routes are taken across the Sahara to the Sudan, is now under Italian control.

Seas and Coasts.

This region, which might be termed *North-West Africa*, has a long coast line, the narrow Strait of Gibraltar separating the Atlantic shores from those bordering the Mediterranean. North of the Senegal mouth to *Cape Ghir* there is a desert coast with no openings of any importance. Between Cape Ghir, where the Atlas mountain system reaches the coast, and *Cape Spartel*, where the rock structure approaches that of Gibraltar, the coast borders the fertile plain of Tensift.

East of Cape Spartel the north-east direction of the mountains causes projecting headlands, which protect the neighbouring bays from the north-west gales prevalent along this coast. The continuation of the Atlas Region to *Cape Blanco* and *Cape Bon* is responsible on the Tunisian sea-board for a number of openings protected by headlands, and the proximity of this shore to the adjacent coasts of Sicily gave to Carthage its importance in past ages, when the Sicilian Gate formed the passage-way between the Eastern and Western Mediterranean.

The *Gulf of Gabes* forms a wide opening at the southern border of the Atlas system, while farther to the east the *Gulf of Sidra* divides the coast-line of Tripoli into two parts, that to the west between these two gulfs consisting of an alluvial coastal plain, while to the east of the Gulf of Sidra a narrow coastal plain borders the steep edge of the Barka Plateau. East of this the coast fringes the Libyan Desert as far as the Nile Delta.

As water abounds in the shallow streams the coast north of the Senegal approximates to the conditions of the Sudan, and under the lee of *Cape Blanco* is an important fishing ground. North of that cape stretches a true desert coast, and the so-called *Rio de Oro* (River of Gold) is in no sense a river, nor does it produce gold. Beyond *Cape Bojador* is an unbroken surf-beaten coast, reach-

ing to *Cape Juby*, and this sea-board is rendered still more dangerous by the marine current, which, travelling from north to south, here contracts to pass through the channel between the Canaries and the mainland. The rough seas experienced are accentuated in winter by the prevalent west winds blowing from the ocean to the land.

Bizerta Bay, north of Cape Bon, is now an important French naval station having an importance similar to that of the British naval station on the island of Malta, which guards the Sicilian Gate on its eastern side. South of Bizerta Bay and Cape Blanco is the *Gulf of Tunis*, which is now connected by a ship canal with the inland lagoon, thus allowing vessels to reach Tunis.

The *Gulf of Gabes* forms a wide opening giving easy access to the southern boundary of the Atlas system and the Sahara. The entrance to this opening is guarded by many islands. Notice on Map 19 that inland from the gulf are a number of shotts or shallow salt water lagoons, forming the remains of a much larger opening which once occupied this plain. Projects have been made in modern times to restore this gulf to its original size by flooding the low-lying interior.

The best qualities of red coral are obtained from the Tunisian shore, although the formation extends along the shores of the Atlas Region. The Tunisian sea-board is bordered by a number of lagoons, separated from the sea by strips of sand, and these are frequented during the breeding season by large numbers of fish, chiefly tunny, while the warm, tideless Mediterranean gives rise to a growth of sponges along this coast.

Islands.

Near the Sahara coast, and separated from *Cape Juby* by only 65 miles, lie the *Canary Isles*, a group of seven large islands and a number of small, rocky islets. North-west from these, and 400 miles from the Morocco coast, is another group consisting of the large island of *Madeira* and various small islets, while 900 miles from the coasts of Portugal and Northern Africa lie the *Azores*. Although all these islands are usually associated with the African continent, yet only the Canary group has any true geographical connection. The Azores, in the Mid-Atlantic,

and Madeira are both more intimately connected with Europe than Africa. Owing to their distance from the mainland, these Atlantic islands have an insular climate, and this, coupled with their positions in the track of great ocean liners, has given them an importance greater than their size and population warrant. The Azores and Madeira groups are Portuguese possessions, and the Canaries belong to Spain.

The *Azores* are of volcanic formation, many of their peaks rising to 8000 feet. They comprise many islands, nine of which are inhabited. Situated in Mid-Atlantic, they enjoy an equable and healthy climate although exposed at times to fierce Atlantic gales. The rainfall of sixty inches per year is ample for the sub-tropical vegetation which clothes the slopes. The cultivated products include St. Michael *oranges* (from the large island of *San Miguel*), the *vine*, and *maize*. Cattle rearing creates a *butter* and *cheese* making industry. *Ponta Delgada*, on the island of *San Miguel*, is the chief port and seat of government.

The *Madeira Group* is connected in structure with Southern Europe. The large island of the same name, with an area of 314 square miles, is traversed from east to west by a mountain range 4000 to 6000 feet high, with rivers descending in rugged gorges to the coasts on either side. The remarkably mild and equable climate has attracted many invalids, and the mean annual rainfall, most of which falls in winter, is only thirty inches. The islands produce splendid *grapes*, and wine is an important article of export. *Sugar-cane* and *cereals* also flourish. *Funchal*, on the sheltered south coast, is the chief centre of population and the capital. It is also a calling port for vessels travelling between Europe and South Africa.

The *Canary Group* consists of seven large islands, including *Grand Canary*, *Palma*, and *Teneriffe*, and a number of smaller islets, all of volcanic formation. Many of their peaks rise to 6000 and 7000 feet, and the *Peak of Teneriffe*, an extinct volcanic cone, reaches to over 12,000 feet. This mountain rises above the region of the Trade Winds, and the warm, moist westerly winds blowing here in the upper atmosphere cause clouds to gather round its summit. Lying in the track of the dry North-East Trades, and separated from the mainland by only 65 miles, the

islands have not such an equable climate as that of Madeira, much of the interior basaltic rock being arid owing to the deficient rainfall. The climate is, however, salubrious, and many consumptives and other invalids are settling on these islands.

Large crops of *grapes*, *bananas*, *potatoes*, and *tomatoes* are grown, the drier cactus vegetation supports the *cochineal* insect, which is reared for the sake of its *red dye*, and herds of *goats* feed on the mountain pasture.

Santa Cruz, on the island of *Teneriffe*, is the seat of government, but *Las Palmas*, on *Grand Canary*, is far more important, being a coaling station and free port for steamers on the routes from Europe to the Guinea Coast and to the Cape.

EXERCISES.

1. Describe the structural connection between Europe and the Atlas Region. Illustrate by a sketch map.
2. Trace a map of the Western Mediterranean. Insert the Sicilian Gate, Strait of Gibraltar, Ceuta, Malta, Carthage and Bizerta Bay. Show how position has made Malta and Bizerta Bay important.
3. Illustrate the influence of the sea by a reference to the climates of the islands off the north-west coast of Africa. State the chief products grown in each of these groups, and the climatic conditions upon which they depend.
4. Describe the coasts of Tunis and Tripoli, and state the trade importance of each.
5. Draw a map of North-West Africa. Insert (1) the chief islands; (2) the chief sea routes; and (3) the ports of Funchal, Las Palmas, Malta, and Tunis.

Surface.

Atlas Region:—

The Atlas system of mountains consists of a mass of ranges, detached ridges, escarpments, and intervening plateaux, rather than a distinct mountain chain. The general trend of this system is from south-west to north-east, roughly parallel to the Sierra Nevada of the opposite shore, to which it is allied in structure. The whole system extends from Cape Ghir in the south-west to Cape Bon in the north-east.

In the western part, from Cape Ghir to Cape Tres Forcas, there stretches an unbroken mountain mass, consisting of a long line of

lofty crests extending hundreds of miles, and forming a water-parting between the streams flowing north-west to the Atlantic Ocean and Mediterranean, and those flowing south-east towards the Sahara.

The *Rif Mountains*, which are a continuation of the rock structure of Southern Spain through the Strait of Gibraltar and Cape Spartel, border the coast, and join this lofty mountain mass, leaving the triangular *Plain of Tensift* bordering the Atlantic shore.

Beyond the borders of Morocco the mountain rampart of the Great Atlas is continued as a plateau from 90 to 100 miles broad, bordered on its northern side by a number of parallel, terraced escarpments, which reach the coast. These terraces of the plateau appear from the sea as a number of parallel ranges increasing in height towards the interior, and, with their verdure-clad slopes watered by the streams draining to the Mediterranean, form the *Tell Region*. The broken line of escarpments sometimes known as the *Coast Range* is not strictly a mountain range, but a number of detached ridges between which the rivers find an outlet to the sea.

The southern borders of the plateau in some places slope gently towards the Sahara, but in others form abrupt escarpments 7000 feet high.

Towards the east the plateau narrows considerably, and the direction of the *Mejerda* and other rivers indicates a gradual slope in that direction. Hence the escarpments are not nearly so lofty in Tunis, and reach the coast as projecting headlands separated by inlets. The continuation of this range on the opposite shores of Sicily and through the Apennines of Italy makes a continuous rock framework enclosing the Western Mediterranean.

The mountain rampart of the Atlas system in Morocco reaches its highest point in *Tizi-n-Tamjurt*, 14,760 feet above sea-level, and the whole of the Moroccan system rises high above the limit of perpetual snows, and has a mean elevation of 11,000 feet.

South of the Great Atlas lies the smaller *Anti-Atlas*, running parallel with and separated from the main system by the upper valley of the *Draa*, and farther to the west by the river *Sus*. Most of this region, lying on the verge of the desert, is inaccessible, and hence to a

great extent unsurveyed. Between the *Sus* and *Draa* valleys it is connected with the Middle Atlas system, forming the water-parting between the two rivers, while farther east it merges with the main range near *Jebel Aishin* (11,500 feet above the sea).

The abrupt edges of the *Sahara escarpment* of the plateau, although not a continuation of the Moroccan Atlas system, form a lofty detached mountain mass culminating in *Jebel Mis*, over 7000 feet high, while farther east the *Aures Group* represent the highest mountains of Algeria. In Tunis, where the plateau contracts, the *Zaghwan Range* terminates in Cape Bon.

The *Plateau*, which extends from the eastern border of Morocco to Tunis, has an average elevation of 3800 feet (equal to that of the Scottish Highlands). It forms a monotonous region having a scanty vegetation, and scattered over it are a number of salt water lakes and marshes known as *Shotts*, the largest being the *Shott-el-Gharbia*. Notice on the map the long chain of shotts running in a north-easterly direction from the Moroccan border. These now form isolated closed basins losing their water by evaporation, and hence are very salt, but in some past age they probably drained *via* the river *Shelif* to the sea.

The *Tell Region*, consisting of the terraces from the plateau edge to the coast, is the most productive area of Algeria. Its area of 54,000 square miles is watered by many streams, and in addition to large areas of cultivated lands, contains extensive tracts of forests and rich pasture lands.

The *Rif Mountains*, culminating in *Beni Hassan* (6500 feet), form only one of a number of chains which run parallel to the northern coasts and border the *Plain of Morocco* or *Tensift*.

Rock Structure.

Atlas Region :—

The prevailing, stratified rocks in this region are limestone and sandstone, while shales also occur. The mountain masses are mostly porphyritic, but towards the desert edge are replaced by granite. There is no sign of recent volcanic action, but in Morocco is a huge dyke of basalt, and the sedimentary rocks show signs of internal disturbance in many places.

Moraines and other debris give evidence that glaciers once covered large parts of this area. The alluvium brought down by the streams contains gold dust, thus proving the presence of gold-bearing rocks. Rich copper deposits are known to exist in the Sus valley, while iron is plentiful throughout the whole area. The soils are mostly clays and sands resting on limestone beds, the existing red ochres being responsible for the natural red colour of the soil.

River Drainage.

Atlas Region :--

Owing to the hot, dry summers prevalent in this region, and to the surface nature of the country, there are no navigable waterways, and except for irrigation purposes the streams are useless. Those which descend from the plateau either flow northward towards the Mediterranean or Atlantic, or towards the desert. These latter during the winter rains flow to large lakes or shotts bordering the desert, or else sink through the sand to an impermeable layer of clay below, thus forming underground reservoirs. In the summer they are mostly dried-up water-courses.

The rivers which flow from the plateau to the Mediterranean descend the terraced escarpments and have to find an outlet through the gorges of the Tell Atlas Ranges. Hence for much of their course they flow in channels parallel with the mountains. Notice on the map the *Mejerda* and the *Shelif*. The former flows in a long channel in a north-easterly direction parallel to the coast, while the latter flows in a south-westerly direction before it finds an outlet.

The north-easterly direction of the Atlas Mountains cause the *Sebu*, *Tensift*, and *Sus* to drain towards the Atlantic, while the *Muluya* flows towards the Mediterranean. Owing to the perpetual snows on the higher mountains of Morocco, these streams have a great volume, but although they have a fairly long course across the plain, the sand-bars at their mouths prevent navigation.

All the rivers which flow towards the Atlantic and the Mediterranean shores vary considerably in volume. During the copious rains of winter they carry much mud to the sea, discolouring it for miles, but in the dry season they have not sufficient water to

force a way through the sands at their mouths, and this volume is further reduced by the water taken from them for irrigation purposes.

The subterranean reservoirs which underlie the surface bordering the desert provide the water for hundreds of artesian wells which have been sunk in this area, thereby converting desert lands into irrigated areas. These borings could possibly be continued southward along the wadis of the Sahara, and large areas which are now useless may be irrigated in the near future. Inland from the Gulf of Gabes notice the *Shott-el-Jerid* and other salt water lagoons. These now contain very little water, but probably once formed part of the sea. From the limestone ranges which border these lakes on the north, numerous springs, some cold and salt, others warm and fresh, form streams carrying water to these lakes. Much water is however utilised for irrigation purposes, and hence the inland lakes receive little and are decreasing in depth.

The *Mejerda*, 300 miles long and draining an area of 10,000 square miles, rises in the Aures Mountains of the Saharan border. After crossing the plateau it flows through winding gorges to the fertile plains in its lower course, where it enters a large marine inlet, which until lately was separated from the Mediterranean by a narrow, inaccessible channel. The cutting of a canal, joining the inlet to the Gulf of Tunis, has brought the lower course of the river within easy access of the sea.

The *Shelif*, 420 miles long, is the largest river of this region, but throughout its course is not navigable even for the smallest craft, although it is very valuable for irrigation purposes. It rises on the Sahara edge of the plateau, and crosses it in a north-easterly direction till it breaks through a gorge, when it flows in a south-west direction parallel with the coastal escarpment until it reaches the sea. Other rivers draining the Algerian Tell are the *Sig*, *Metidja*, and *Sahel*.

The *Muluya*, flowing through Morocco, rises in the Jebel Aishin Mountains and flows north-eastward parallel with the trend of the mountains, and empties east of Cape Tres Forcas.

The *Sebu* drains from the Middle Atlas to the Atlantic coast. From Fez, where the

river leaves the mountains, it flows across the plain of Morocco.

The *Draa*, forming the southern boundary of this region, is a wady seldom reaching the Atlantic. The connection between the Anti-Atlas and the main chain forms the water-parting between this river and the *Sus*, and gives to the *Draa* a copious supply of water, which it loses on its south-west journey across the desert.

Surface and Structure.

The Sahara:—

The orographical map of this region shows that the desert is not a dead level sea of sand which once formed the bed of the sea, but rather the remains of a plateau mass which has been denuded to its present form by the continual expansion and contraction of the rocks, due to the daily range of temperature and to dry wind erosion.

Running in a south-east to north-west direction from the plateaux of South Africa almost to meet the Atlas Region is a belt of higher ground known as the *Tibesti Mountains*, rising in *Mount Tusidde* to 8850 feet. This ridge forms the dividing line between the Western Sahara, with its varying structure and many indications that it once was a well-watered region, and the eastern Libyan Desert, consisting of a dreary waste of shifting sands which have remained unchanged for thousands of years.

The *Tibesti Mountains*, with the north-eastern extension in the *Tademat Plateau* and its western extension known as the *Ahaggar Plateau*, consist chiefly of granite and volcanic rocks which have not yet succumbed to denudation. The *Air* or *Asben Plateau* forms a distinct orographical centre, 4000 feet high, midway between the *Tibesti Mountains* and the *Niger Basin*.

Elsewhere, in the *El Erg*, the *Desert of Igidi*, and in the *Hammada-el-Homra*, are sand-dunes forming parallel ridges from 50 to 500 feet high, while, in the interior are numerous hollows, which, in former times when the rainfall was more copious, formed basins of inland drainage like those of *Lake Tchad*. Notice on the map the lowlands of *El-Juf* in the west, that of *Twat* farther north, and the hollows of *Fessan* and *Kufara* in the north-east.

The Sahara approaches the Mediterranean in the state of Tripoli. Here the Gulf of

Sidra divides the structure into two parts. The western forms the *Nefusa Range*, which, stretching from *Gabes* to *Sidra* in a great semicircle, is really the coastal edge of the plateau, consisting of precipitous basaltic and limestone cliffs fronted by the low alluvial *Jafara* plain. Inland these cliffs border the inhospitable *Hammada Region*. The *Barka Plateau*, on the east side of the Gulf of *Sidra*, is allied in structure to Europe. It has a steep slope to the coast, and a more gradual one to the interior, where there is a line of depressions which can be traced on the map eastward through the *Aujila* and *Sirwah Oases* to *Birket-el-Qarun* in the *Fayum* depression (See Chapter III.), and so to the *Bitter Lakes* of the Isthmus of *Suez*.

On the map trace the dried water-courses of the *Wady Igharghar*, whose chief streams rose in the *Ahaggar Plateau*, and from thence flowed north-west to the *Shott-el-Melrir*. The oases of *Ghat* and *Ghadames* were once connected with this river valley when the stream found its way to the Mediterranean. Water can now be obtained from its bed by sinking artesian wells.

The oases differ in their natural conditions. Some of them are due to surface drainage or infiltration from underlying rocks. Such are the *Wadi Draa* and the oasis of *Tafilet*, which obtain their water from the anterior slopes of the Atlas. Some are due to natural springs, such as *Ghadames*. Others, such as *Kawar*, between the *Tibesti Mountains* and *Lake Tchad*, and those of *Fessan* owe their existence to underground reservoirs, while others obtain their water by means of artesian wells.

Fixed sand-dunes are probably due to water being drawn from underground by capillary attraction. Hence the drifting sands become water-logged and heavy, and so are piled up in permanent hills.

The plateau formation of the desert, is indicated by the fact that the traveller crossing the desert by any route must ascend heights from 1000 to 2000 feet. The plateau has probably been lowered 1500 feet by erosion. The great difference between day and night temperatures is common to all desert regions, and the denudation caused by this, is accelerated by the mechanical action of the particles themselves when they blow against the still resistant masses. This sand differs

from that of the sea, in that it displays great fertility wherever supplies of water can be obtained.

EXERCISES.

1. Describe the Atlas system of mountains, and show its connection with the mountain systems of Europe. Illustrate by a sketch map.
2. Describe the Tell Region. Show why it is more productive than the plateau of Shotts.
3. Name the chief rivers of the Atlas Region. Show how their courses are determined by the rock structure.
4. Prove that the Sahara is not a level expanse of sand which once formed the bed of an inland sea.
5. From the present distribution of oases and water-courses describe what the Sahara was like when it had a more copious rainfall.
6. What is the cause of the sand of the desert, and how are sand-dunes formed?

Climate.

Map 3, showing the July Isotherms, indicates that the greater part of the *Sahara Region* has in July an average temperature of over 90° F., and consequently forms a low-pressure region during the summer months. Its average January temperature is between 60° and 80° F. These figures do not give a correct idea of the temperatures, as the differences between that of day and night are very great, the shade temperature during the day often reaching 120° F. The prevailing wind is an inflowing one, flowing from the land regions of Asia. As this indrawn air travels from a cooler to a hotter region its capacity for holding moisture is increased, and consequently it comes over the Sahara as a dry wind. The climatic conditions of the Sahara are rendered less bearable by the strong local outflowing winds, whose influences are felt as far north as the Alps of Europe, and as far south as the Guinea Coast. Known as the *Simoon* in the Sahara, the *Khamsin* in Egypt, the *Solana* in Spain, the *Sirocco* in Italy, and the *Harmattan* in Upper Guinea, they produce hot, suffocating effects in each country, while the sand carried outwards is deposited everywhere within a large radius.

The climate of *Tripoli* is similar to that of the Sahara, and in many districts years pass

by without any rain. When it does fall it pours in such tropical torrents as to wash away all surface soil from the roots of the plants, thus producing more harm than good.

Maps 2 to 5 in the first chapter show that the *Atlas Region* has a range of temperature of 20° F., varying between 50° and 60° in winter and between 70° and 80° in summer, with the rainfall occurring mostly in winter. Over the greater part of this region the winter rains commence in October, and in March are succeeded by a long, hot, dry summer. This rainfall, similar to that of Southern Europe, is caused by the migration of the sun's vertical rays north and south of the equator, thus causing this region to get the dry North-East Trades in summer, and the wetter West Winds in winter. Most of this rain is deposited on the seaward slopes of the terraced escarpments, but on the plateau itself, and towards the desert, the rainfall decreases rapidly. The Atlas Region may thus be divided into the following climatic belts:—

- (1) The sea-board, with mild winters and summers tempered by the proximity of the ocean.
- (2) The coast ranges, with cool summers owing to the sea's influence, and cold, frosty winters with snow due to their altitude.
- (3) The interior plains and plateaux, having hot, dry summers and little rain, which falls in winter.
- (4) The higher mountain masses, which on account of their altitude are covered with snow on their northward slopes.
- (5) The arid desert edge, with intense summer heats and oases flooded by the rains of winter.

The lowering of the great Saharan Plateau probably caused the decrease in rainfall. The dried water-courses, the ruins of ancient cities, aqueducts, and dams, all prove that in prehistoric times the rainfall must have been more copious.

The winter rainfall has its effect on the river system of the Atlas Region. The rivers flowing to the Mediterranean carry an immense volume of water and alluvium to the sea in winter, but during summer can barely force a passage through the sands at their mouths. Similarly the rivers draining towards the Sahara carry much water to the shotts bordering the

ATLAS REGION AND THE SAHARA.

desert edge in winter, and large areas are watered and verdure-clad after the rains. In summer these form dried water-courses, and the land on either side is bare and sandy. Those river gorges on the Algerian border are called by natives "The Mouths of the Sahara."

EXERCISES.

1. What is the cause of Trade Winds? Show their effect upon the climate of the Sahara and the Atlas Region.
2. Name a desert region which borders the sea coast. State the climatic causes which give rise to such a condition.
3. Why is the daily range of temperature in the Sahara very great? What is the effect of this range upon the structure of the desert?
4. The Sahara is the birthplace of several local winds. Name these winds and the areas over which they blow. Show the climatic effects of these winds upon these areas.
5. In the division of Africa into Natural Regions Tripoli is included with the Sahara rather than the Atlas Region. Give any reasons you can which justify this division.
6. Into what climatic zones could the Atlas Region be divided? Give reasons for the divisions you choose.
7. Describe the Mediterranean type of climate. What is its cause? Show its effect on the rivers of the Atlas Region.

Flora.

The vegetation of the Sahara forms a distinct barrier between that of the summer rain belt of the Sudan on its southern border and the winter rain belt of the Atlas Region on the north. It must not, however, be supposed that the desert is a sea of sand absolutely devoid of vegetation. Coarse grasses, chiefly *alfa* in the northern parts and *drin* towards the south, both well able to withstand drought, cover large areas, the latter forming excellent fodder for camels. *Mimosas* and *acacias* are characteristic of the southern regions, *gum-producing* trees grow in some parts, the *tamarind* flourishes on the tops of the dunes, while the presence of water at their base is often responsible for a rich vegetation. Even with this vegetation, the greater part of the Sahara forms a dreary waste, in striking contrast with the rich vegetation found in the oases.

The vegetation of *Tripoli* forms a transition stage between that of the desert and that of the Atlas Region. The oases of Fezzan possess the same characteristic vegetation as those of the desert, and yield fodder for the camels of the caravan trade, but along the shores of Tripoli and Barka the intermixture of the date and the olive indicates the merging of desert and Mediterranean conditions. Southern fruits, such as the *vine*, *fig*, *apricot*, and *pomegranate*, are grown, while the wadis are bordered with forests of trees yielding *gum*.

The *Atlas Region*, having a climate similar to that of the opposite Mediterranean shores, possesses a similar flora, but owing to its lower latitude and consequently warmer climate, plants of a more tropical nature intermingle with the true Mediterranean products. In Algeria and Tunis the flora is closely related to that of the opposite Italian shore, while in Morocco the vegetation more nearly approximates to that of the opposite Iberian Peninsula.

Three distinct zones of vegetation corresponding to the climatic zones can easily be traced. The seaward slopes of the Tell Region are thickly forested with *cork-oak*, *cedars*, *acacias*, *myrtles*, *pinces*, *white poplar*, and *evergreen trees*, the irrigated cultivated lands yielding *wheat* and *barley*, *pulses*, *onions*, and *vegetables*, in addition to large growths of the *vine* and *olive*. The drier plateaux are covered chiefly with *alfa* and other grasses, while the surrounding escarpments abound in scrubs, consisting of *aloes*, *juniper*, *agave*, *castus*, and other plants able to withstand the drought. Towards the desert edge the more tropical *date palm*, which grows largely in the oases, forms the staple food of the people.

In the desert, oases forests of *date palms* are plentiful, while crops of cereals such as *wheat* and *barley*, fibres such as *cotton*, fruits like the *vine*, *peach*, and *apricot*, and other cultivated plants flourish. These oases, occupying an area of 80,000 square miles, prove that the soil of the desert is extremely fertile, and the lack of vegetation is due entirely to want of water.

The absence of forest growth on the Algerian Plateau is not entirely due to the arid climate but to the pastoral Arabs, who have destroyed all forms of vegetable life which do not provide fodder for their flocks and herds.

The seaward slopes of the Moroccan Atlas are thickly forested, and this vegetation also covers large parts of the plain. The chief trees are *cork* and *evergreen oaks*, but *firs*, *cedars*, *acacias* are also prevalent, while towards the south these give place to *dates* and *gum-producing* plants. The extremely rich vegetation of Morocco under careful cultivation should become highly productive. *Olives*, *walnuts*, *almonds*, *cotton*, and *vine* grow wild, in addition to *fennel*, *capers*, *mulberry*, and *carobs*, while with but scant attention crops of *millet*, *barley*, *wheat*, *maize*, *rice*, *lentils*, *hemp*, and *flax* are obtained.

Fauna.

The animals of the Sahara are peculiarly adapted to their surroundings. They are few in number, and are not closely related to those of the Sudan. The higher lands, which, owing to a heavier rainfall, are covered with vegetation, form a cover for *hyenas*, *jackals*, and *wild boars*, and a few *lions* are found in the Tibesti Mountains. *Gazelles* exist in the poorer grass lands, while in the oases are pastured such domestic animals as the *horse*, *ass*, *goat*, *sheep*, and a small variety of *cattle*. The *camel* is, however, the animal of the desert, and is useful both alive and dead. Tripoli possesses a similar fauna. *Mouflons*, or wild sheep, and *gazelles* roam the poor grass lands, and *hyenas*, *jackals*, and *wild boars* inhabit the thickets on the higher lands.

In the Atlas Region the fauna does not resemble that of the remainder of the Mediterranean Region. *Lions*, *panthers*, *bears*, *wild boars*, *jackals*, and *hyenas* still roam the forests, and *antelopes*, *gazelles*, and *mouflons* inhabit the pasture lands. The chief domestic animals resemble those of Mediterranean Europe, and include the *horse*, *mule*, *sheep*, and *goat*, while *camels* are also reared for the transit trade across the desert. Swarms of *locusts* often work havoc on the crops, and hence the *stork*, which frequents the Tell Region from January to August, is everywhere protected, because he assists largely in keeping down these pests.

The *camel*, originally introduced from Arabia, not only provides the sole means of transit across the desert and yields milk when alive, but when dead provides his owner with hair for weaving into cloth and canvas, leather, and even meat.

Snakes frequent the oases, and *vipers* are a plague in Tripoli. *Marmots* are also prevalent in Tripoli.

The *cuckoo* winters in Northern Africa, and other birds of the Atlas Region include the *eagle*, *falcon*, and *vulture*, *pigeon*, *partridge*, and *quail*, while *herons*, *pelicans*, *swans*, *ducks*, *grebes*, and *storks* frequent the waters.

The *carmine dye* used in the Fez cap industry is obtained from the *Kermes insects*, which feed on the cactus plants grown in Morocco.

Minerals.

Morocco is known to contain rich deposits of *copper*, *iron*, *lead*, *antimony*, *sulphur*, *silver*, and *gold*, but the hostility of the native tribes has so far prevented any European development, and no minerals are exported, but in Algeria and Tunis *iron*, *lead*, *zinc*, and *copper* are worked extensively. *Petroleum* has been found at Oran, while the output of *phosphates* has increased to a large extent during recent years. The only mineral wealth of the desert is the *salt* obtained from the oases, which finds a ready market in the Sudan, itself deficient in this mineral.

Rich *copper* deposits are known to exist in the Sus Valley, where a mine was formerly worked. *Iron* is found near the surface in all the western ranges, but mined chiefly at *Bona* and *Oran*, being worked in open quarries at the latter place. *Argentiferous lead* is found at *Tetuan*, *sulphur* near *Algiers*, and *copper*, *zinc*, and *phosphates* in Eastern Algeria and Tunis, where *Tebessa* is the most important centre. Algeria is also rich in *marble*, *alabaster*, and other *decorative building stones*, and these are obtained chiefly from *Oran* and *Constantine*.

Products of Commercial Value.

Morocco is a country of great possibilities. It has rich plains of great fertility, watered by rivers capable of being used for irrigation, and all kinds of cereals and sub-tropical fruits could be grown, while the forested slopes could be made to produce valuable supplies of timber. The bad government of the Sultan and his officials caused not only insecurity of property, but did all possible to prevent the introduction of European methods and trade (see note on Historical

Development). Hence none of the rivers are irrigated, and only very primitive means of agriculture are practised. The same government has prevented the development of the rich mineral wealth known to exist in the interior. Since 1911 the French have established a protectorate over this state, and it is hoped that under their influence this country may be developed and her possibilities utilised to the fullest extent.

At present the chief products of this state are *hides, skins, and wool* obtained from the pasture lands of the interior; *eggs*, obtained from poultry reared on the plains; *dates*, an important product of the *Tafilet* oasis of the interior; *olive-oil, barley, gums, and almonds*.

The products of Algeria and Tunis present a remarkable contrast to those of Morocco. Having a less favourable position than the latter, they are, owing to the French government, far more productive. The French have established many irrigation works, and have built railways enabling the produce to be carried to the coast, while under their wise government many of the native Berbers have settled down to agricultural occupations.

The fertile Tell Region produces large quantities of *grapes, olives, tobacco, wheat, and barley*, while *onions* and other *vegetables* form an increasing export. The forested slopes of the mountains yield *cork* and *timber*, the drier plateaux forming rich pasture land on which *sheep* and *cattle* are reared.

10,000,000 acres of these plateaux are devoted to *alfa* grass, used in the manufacture of paper, but owing to the increasing use of wood pulp for this industry, the value of this grass is decreasing.

Towards the desert edge the chief commercial product is *dates*, those of *Biskra* being noted. The development of the minerals has caused a large export of *iron, copper, lead, zinc, and phosphates*.

The semi-desert state of Tripoli and the great Sahara Desert yield little of commercial value to the outside world.

Barley and *wheat* are the chief cereals, and *dates* (chiefly in *Fessan*), *oranges*, and *lemons* are the chief fruits grown in *Tripoli*. *Cattle* and *sheep* are bred on the poor pastures, and *esparto* or *alfa* grass is grown. *Sponges* are obtained from the almost tideless sea.

F—AFRICA, SEN.

The chief products grown in the oases of the *Sahara* either provide food for the settled inhabitants or for the Arab caravans, which use these oases as stopping-places in crossing the desert.

Manufactures.

These, in the Atlas Region, are comparatively unimportant. There are several famous hand industries in Morocco, notably the *leather* articles made from the skins of the pasture animals, the *shawls* and *rugs* made from the wool obtained from the local sheep, and the *Fez caps* worn by the Mohammedans. In addition to these, the people of Morocco are clever *dyers* and *weavers*, and workers in *iron, brass, and bronze ware*, while they have local manufactures of *soap, lime, pottery, bricks, and wickerwork*.

Although the vegetable and mineral resources of Algeria and Tunis form their chief asset, yet there are some manufactures, the most important being that of *olive-oil*, obtained from the home-grown fruit, and this has led to a *soap* industry, for which *Constantine* is the chief centre. The chief native industries are the *spinning* and *weaving of wool*, and the manufacture of *carpets, saddles, slippers, pottery, and embroidered leather goods*.

Manufactures are of no importance at all in Tripoli or the Sahara, although in the oases of the latter there is some weaving of *camel-hair cloth*.

EXERCISES.

1. Show the effect of climatic and surface features upon the distribution of vegetation in the Atlas Region.
2. Name the chief manufactures of the Atlas Region. Show how these are dependent upon supplies of raw material. Why is this area never likely to become a busy manufacturing region?
3. Name the parts of this area which are fully developed and the chief vegetable products obtained from them. Show those parts which are capable of greater development.
4. Describe the vegetation of the desert and its oases. Apply your answer to prove that the greater part would be capable of cultivation if the rainfall were sufficient.
5. "The Atlas Region is allied in structure, climate and vegetation to the opposite shores of Europe, but its fauna is entirely distinct." Justify this statement.

6. Large parts of the Atlas Region are pasture lands. State the position of these areas and the chief products obtained from them.
7. Describe some form of irrigation. Show the effect of irrigation upon the cultivated lands of Algeria and Tunis.
8. Describe the distribution of minerals in the Atlas Region, and show where they are capable of development.

Routes.

The roads and railways of Algeria and Tunis, which have been constructed by the French, present a marked contrast to the communications in the remainder of this area. Elsewhere there are few roads and no railways, while the Sahara proper boasts no navigable waterway, no road, and no wheeled vehicles of any kind. The camel caravans, following regular routes from year to year, provide the only means of communication across the desert. These also form the chief means of communication in Tripoli, and the commercial importance of this state is due almost entirely to the trade which takes place along its Mediterranean shores. Here the produce brought across the narrowest part of the desert from the Sudan Plateau is exchanged for the manufactured goods of Europe.

The development of Morocco is largely impeded by its lack of communications. There are no railways, few roads, and no wheeled carts. Most of the internal trade is carried on by means of mules or camels, which traverse the rugged, narrow bridle paths serving as roads. It is hoped that under French control railway, road, and river communications will become possible. The Sebu might easily be made navigable to Fez at the foot of the mountains, and many of the other rivers could be similarly utilised.

The advantages of a strong, wise government are clearly shown in the Eastern Atlas system, where excellent railways are supplemented by good roads, while ship canals and harbour works allow of a large export of the rich products of the interior.

Railways :—

Place Blank Orographical Map 3 from the envelope of your Atlas under Route Map 20. Trace the main line of railway which commences on the Moroccan border and passes through *Oran* and

Algiers to *Tunis*. Notice that, owing to the mountain escarpments reaching to the coast, the railway runs inland but parallel to the seaboard, using the longitudinal valleys of such rivers as the *Shelif*, while in its eastern part it reaches *Tunis* by following the *Mejerda* valley. Branches from this railway are carried through the gorges to the coast at *Philippeville* (the port for *Constantine*), *Bona*, and *Bizerta*. At *Tunis* the railway follows the coast to the more southern ports of *Susa* and *Sfax*. In addition to the coast branches, notice those which lead to the interior. The first from *Oran* to the *Figig* oasis is projected to *Igli*; the second, which now leads from *Constantine* to *Biskra*, forms part of a projected Trans-Saharan railway, which will follow the *Igharghar* water-course to the *Ahaggar Plateau*, and from thence to Lake Tchad and the Sudan *via Air* or *Asben*. Farther to the east are two lines of railway to *Tebessa*, which is the centre of a busy zinc, copper, and phosphate mining district. The railway from *Sfax* is also carried inland to *Gafsa*, also a mining town, while a branch leads from *Susa* to the sacred city and religious capital of *Kairwan*, and from thence to *Kef*.

Caravan Routes :—

It has been already shown in Chapter IV. that much of the produce of the Sudan finds an outlet by camel caravan across the Sahara to the Mediterranean shore. The shortest distance across the Sahara is from Tripoli to Lake Tchad, and the large exchange trade on the Tripolitan seaboard accounts for the Italian occupation.

The average day's march of a camel caravan is from 18 to 20 miles, and journeys are only made possible across the desert by travelling from oasis to oasis, obtaining from each fresh supplies of food and water.

Trace the following routes on Map 20 and notice how their direction has been determined by the position of the oases :—

- (1) Mogador *via* Tenduf to Timbuctu.
- (2) Tangier *via* Taflet to Timbuctu.
- (3) Oran and Algiers *via* Twat to Timbuctu.
- (4) Tripoli *via* Ghadames and Twat to Timbuctu.

- (5) Tripoli *via* Ghadames and Ghat to Kano and Sokoto.
- (6) Tripoli *via* Fezzan to Lake Tchad.
- (7) Benghazi *via* Kufara oasis to Lake Tchad.
- (8) Tripoli *via* the Aujula and Siwah oases to Egypt.

Commerce, Seaports, Trade Centres.

Morocco :—

The fanatical dislike of a Mohammedan people to European influence has caused the external trade to be small in proportion to the large, fertile area of the interior. In the past foreign commerce has been discouraged by high export duties, and these, together with the insecurity of both life and property, and the bribery and corruption which are universally prevalent, have proved serious obstacles to any growth of commerce. The chief exports are *hides*, *wool*, and *oven*, obtained from the pastoral mountain lands, *eggs*, a largely increasing export, *wheat*, *barley*, *olive oil*, and *almonds*. This external trade is distributed between the United Kingdom, France, and Germany. France (with her African possessions included) has the largest share of the exports, while most of the shipping trade is done by the British.

The chief ports are *Tangier*, *Tetuan*, *Casablanca*, *Mazagan* and *Mogador*, the inland centres of trade being *Fes*, *Mequinez*, and *Morocco* (Marakesh).

Tangier, situated on a sheltered semi-circular bay near Cape Spartel, was once a British possession, but was abandoned in 1684, and all the fortifications, piers, and harbour works destroyed. It is the chief centre of the foreign commerce of the country, and has a large coasting trade with Gibraltar and other ports. Its importance is increased by its healthy and attractive situation and consequent residence of Europeans.

Tetuan, a few miles south of Ceuta, is largely occupied by Jewish traders.

Casablanca, between Rabat and Mogador on the Atlantic coast, has the advantage of a deep roadstead free from the sand deposits which spoil many of the harbours on this coast. Hence it has become one of the most important seaports, doing one quarter of the country's external trade.

Mazagan does a large trade with the Canary Islands, while *Mogador* is the chief port for the trade of the south, its only rival being *Agadir*, lying at the mouth of the Sus, and sheltered by the headland of Cape Ghir.

Spain holds the Mediterranean from *Ceuta* on the Strait of Gibraltar to *Melilla* near the Algerian border, with the exception of *Tetuan*. *Ceuta* is a free port, but has little trade, while *Melilla*, although having a poor harbour, exports the produce of the Muluya Basin.

Fes stands on elevated land where the Sebu leaves the mountains to flow across the plains of Morocco. It is the chief industrial, commercial, and religious centre of the country and is famous for its *silks*, *carpets*, *pottery*, *leather*, and *caps*.

Mequinez, in the Sebu Valley, is connected by a good road to *Fes*.

Morocco commands the fertile plain of the river Tensift.

Algeria and Tunis :—

Remarkable success and prosperity have followed the French control of these colonies. The development of irrigation works, the construction of railways and harbours, and the security of property, have created a steady increase in the export trade of this country. The agricultural lands are responsible for a large export of *wine*, *wheat*, *oats*, *barley*, and *olive oil*; the forests export quantities of *cork*; the drier plateaux produce *sheep*, *hides*, *skins*, *wool*, and *esparto grass*; and the rich mineral wealth provides the export of *phosphates*, *zinc*, *lead*, and *iron*. The greater part of this trade is done with *France*, but the *United Kingdom*, *Germany*, and *Italy* have a fair proportion, the latter trading chiefly with *Tunis*.

The chief seaports of Algeria are *Algiers*, *Oran*, *Bona*, *Philippeville* (the port of Constantine), and *Bougie*; and in *Tunis*, *Tunis* (the capital), *Susa*, *Sfax*, and *Bizerta*. The chief inland trade centre of Algeria is *Constantine*, and *Tebessa* is a busy mining centre. *Kairwan* is the most important inland town of *Tunis*.

Algiers, on the bay of the same name, has an excellent position flanked by a semi-circle of hills, situated midway between the Moroccan and Tunisian borders. It possesses a fine harbour with safe anchorage for naval vessels, in addition to trading and fishing boats. It has

also good repairing docks, and is now an important coaling station on the route to the Far East.

Oran, the second largest port, is the chief city and outlet of the west.

Constantine, connected by 50 miles of railway with its port of *Philippeville*, occupies a strong position on a fortified rock. It has an important *grain market*, and a *soup industry* dependent upon the olive oil obtained locally. *Biskra*, towards the desert interior, and connected with it by rail, is noted for its *dates*, and is increasing in favour as a winter resort.

Tunis is situated on the river plain of the Mejerda. The ruins of Ancient Carthage are in close proximity. This city owed its importance to its position on the Sicilian Strait, which separates the Eastern and Western Mediterranean. Communication by rail is possible up the Mejerda valley, and the cutting of the ship canal joining the lagoon to the open sea enables large vessels to reach Tunis.

Susa and *Sfax* are small ports on the east coast, the former in railway communication with the religious capital of *Kairwan*, which is still the centre of a large caravan trade.

Tripoli:—

Italian control of this state may lead to an increase in her exports. Much of the plateau of Barka in the east could be made productive by irrigation, but at present the chief commerce of the country consists in exporting *ostrich feathers*, *ivory*, and *skins* from the Sudan, and *gold dust* from the oasis of Twat, in addition to *alfa*, *dates*, and a few *cattle* and *horses* from Tripoli itself. *Sponges* obtained from the adjacent seas also form an article of export.

The two chief ports are *Tripoli* and *Benghazi*, while inland lies *Murzuk*, the chief town of the oases of Fezzan, and *Ghadames*, on an oasis to which converge many of the caravan routes of the desert.

Tripoli is almost opposite the island of Malta, with which it is connected by submarine cable. Although sheltered by reefs from the north-west gales its shallow waters render it inaccessible to any vessels except small steamers. Find on the Route Map all the caravan routes which converge on Tripoli. This town owes its importance almost entirely to the trade brought by these caravans.

Benghazi is the chief seaport of Barka, and trades chiefly with Malta. Its shallow harbour is exposed to gales, and can only accommodate small steamers.

Murzuk is the chief centre of population among a number of villages which are grouped together in the oases of Fezzan. Its chief importance depends upon the transit trade between the Sudan and Tripoli.

The Sahara:—

The only commercial product of the desert itself is salt, and hence all the trade consists in the transit of commercial products between the Mediterranean and the Sudan.

The slave trade was once very extensive, the slaves being brought from the Sudan to the Mediterranean coast. Many died by the way, and since the French occupation in both the Sudan and the Atlas Regions, and the British occupation of Nigeria, this traffic has been stopped.

EXERCISES.

1. Tripoli is at present an unproductive region. Show why its acquisition by the Italians in 1912 was of commercial importance to that nation.
2. Describe the railway systems of Algeria and Tunis. Show how far they are dependent upon natural features.
3. Name the chief exports of Morocco. Show how these could probably be increased under a more settled government.
4. "One of the first essentials to the growth of commerce is a good government, free from corruption, and causing security to both life and property." Illustrate this statement by a reference to the Mediterranean states of Africa.
5. State the position and name the chief exports of three of the largest seaports in North-West Africa.
6. Draw a map of the Sahara, and insert the chief caravan routes across it, naming the chief oases on each route.

Distribution of Population.

Except in the French provinces of Algeria and Tunis there has been no regular census of the population taken, hence all particulars outside these states are based upon estimates given by European travellers.

If we exclude the nomad Arab traders

from the million and a half people of the Sahara we shall find that the distribution of the population of the remainder is determined by the position of the oases and of the higher lands, where a slight rainfall causes sufficient vegetation for settlement.

In Morocco the most densely peopled area is the Plain of Morocco, the mountains being occupied by nomadic shepherds. This is also largely true of Algeria and Tunis. The fertile Tell Region with its rich vegetation supports a much denser population than do the poor pasture lands of the plateau, while towards the desert the people live almost entirely on the verdant pastures caused by the oases.

In Algeria there is an average density of 15, and Tunis is more populous with an average density of 20, to the square mile.

Peoples.

Everywhere between the Sudan and the Mediterranean the native peoples belong to the Hamitic branch of the Caucasian or white race. The *Berbers*, who give the name of *Barbary States* to this Atlas Region, were the earliest settlers, and, despite the influence of the *Phœnicians* who founded their kingdom at Carthage, and the *Romans* who afterwards succeeded them, constituted the chief people of this area until the arrival of the *Arabs*. To day they still form a large proportion of the population. They have complexions little darker than the inhabitants of Southern Europe, and either lead a pastoral or settled agricultural life. In many respects they reach a higher intellectual standard than the *Arabs* who have dominated this region since the twelfth century. The name *Moor* is now applied to those Arab peoples who have settled in the towns, but the original term meant Highlanders, and was applied to all the inhabitants of the mountainous Atlas Region. The *Berbers* to-day are chiefly found in the mountain fastnesses, and in Morocco their defiance of the government has led to much warfare, but under the more peaceful conditions in Algeria and Tunis they have been induced to lead a settled life, and have become tillers of the soil.

The great proportion of the Arab population still remains nomad. The large number of *Jews* found in the towns are probably descended from those who were expelled from Southern Europe during the Middle

Ages, while the European development in recent times has caused an influx of *French*, *Spanish*, *Italian*, and *Maltese*, many of whom are traders.

In Tripoli the native population consists largely of *Berbers*, but these have so intermarried with their *Arab* neighbours that they now form one race. *Jews* are numerous in the coast towns, where *Italians* and *Maltese* control most of the trade. The few *Turks* who now remain were mostly civil and military officials under the late Turkish Government.

Settled life in the desert is impossible except in the oases and on the higher lands. In the Tibesti Highlands are a Berber people known as the *Tibus* with many characteristics of the Negro type. Berber *Tuaregs* inhabit many of the oases and the higher lands of Ahaggar and Asben.

The slave trade, which until quite recently has been carried on between the Sudan and Morocco and Tripoli, is responsible for a large intermixture of true *Negro* and *Negroid* races in these two states, and also for a pronounced Negro element in the oases and higher lands of the Sahara.

History.

The position of Carthage (Tunis) at the gateway between the Eastern and Western Mediterranean caused in very early ages an important colony to be founded by the *Phœnicians*, but no attempt seems to have been made to develop the mountainous lands of the interior. Later, Carthage fell into the hands of the *Romans*, and Tunis and the northern slopes of the Algerian Tell became very prosperous, as did also Tripoli, which had been founded by the *Phœnicians* and had later fallen into the hands of the *Greeks*. The Roman occupation of the latter state is not only shown in the ruins of such towns as Cyrene, but also in their irrigation reservoirs, which they made in the gorges of the plateaux, thus converting what is now a desert land into a rich agricultural area. Although the *Romans* made several invasions into the more mountainous regions of Morocco it was chiefly left to the mercy of native chiefs. With the decline of the Roman Empire the whole area was overrun by the *Vandals*, who destroyed the forests to build fleets for attacking the opposite shores. In the sixth and seventh centuries the region

was swept by a great Arab invasion, and Mohammedan Turks and Arabs controlled it until the nineteenth century, except for a short period when Charles V. of Spain governed Tripoli.

The French settled in Algeria in 1830 and founded a military colony, but during recent years the country has become commercially important, and its boundaries have been extended southwards into the Sahara. France invaded Tunis in 1881, and has since proclaimed a protectorate over it, although there is a nominal Turkish ruler known as the Bey.

Morocco remained until 1912 an independent sultanate controlled by Arab rulers, but the mountainous nature of the country, the mixed races of people, and corrupt and bad government were factors which prevented peaceful conditions. Rebellions were always taking place in some part of the country, and Europeans living in this country could not ensure security either for their lives or their property. The inhabitants of the Rif country were particularly troublesome. Under these circumstances the nations of Europe intervened, and the responsibility for law and order was placed on France and Spain in 1906. In 1909, owing to disturbances rising from attacks made by Rifians on Spanish property in the neighbourhood of Melilla, Spanish troops were sent to subjugate these tribes, which rebelled again in 1911. In 1910 the Berbers rose against the Sultan, took Mequinez, and besieged Fez. This caused both France and Spain to send troops. In 1912, by agreements between France, Spain, and Germany, the present government in Morocco was determined.

Although the Turks gained control of Tripoli in the sixteenth century, the country was managed by local Arab rulers until 1835, when the government was remodelled and more directly controlled by the Turks, while forty years later Barka was placed under a separate government. During recent years the Italian traders who settled along the coast objected to the control exerted by the Turkish military and civil officials. Hence, in 1911, Italy claimed Tripoli, and a war broke out, which ended in 1912 by Italy gaining the civil and military control, while the Sultan remained the religious head of the Mohammedan peoples.

The Sahara formed a barrier, which probably

was not crossed by people of the earlier civilisations. The Arabs traversed it in the eighth century, and towards the close of the next century an organised system of caravan trade was carried on, while nearly all the Berber tribes had been converted to Islamism. About this time Mohammedan Negroes founded a strong empire extending to the oasis of Twat, but since that fell into decay incessant warfare between different tribes has been general.

Political Divisions.

The Atlas Region is now practically under French control. By treaties at the close of 1912 with Germany and Spain, France assumed a protectorate over the greater part of *Morocco*. Spain relinquished most of her territory in the south of this state, but increased her hold along the northern Mediterranean shores between Ceuta and Melilla.

Morocco has three capitals - *Morocco* (Marrakesh) on the Tensift, and *Mequinez* and *Fez* on the Sebu.

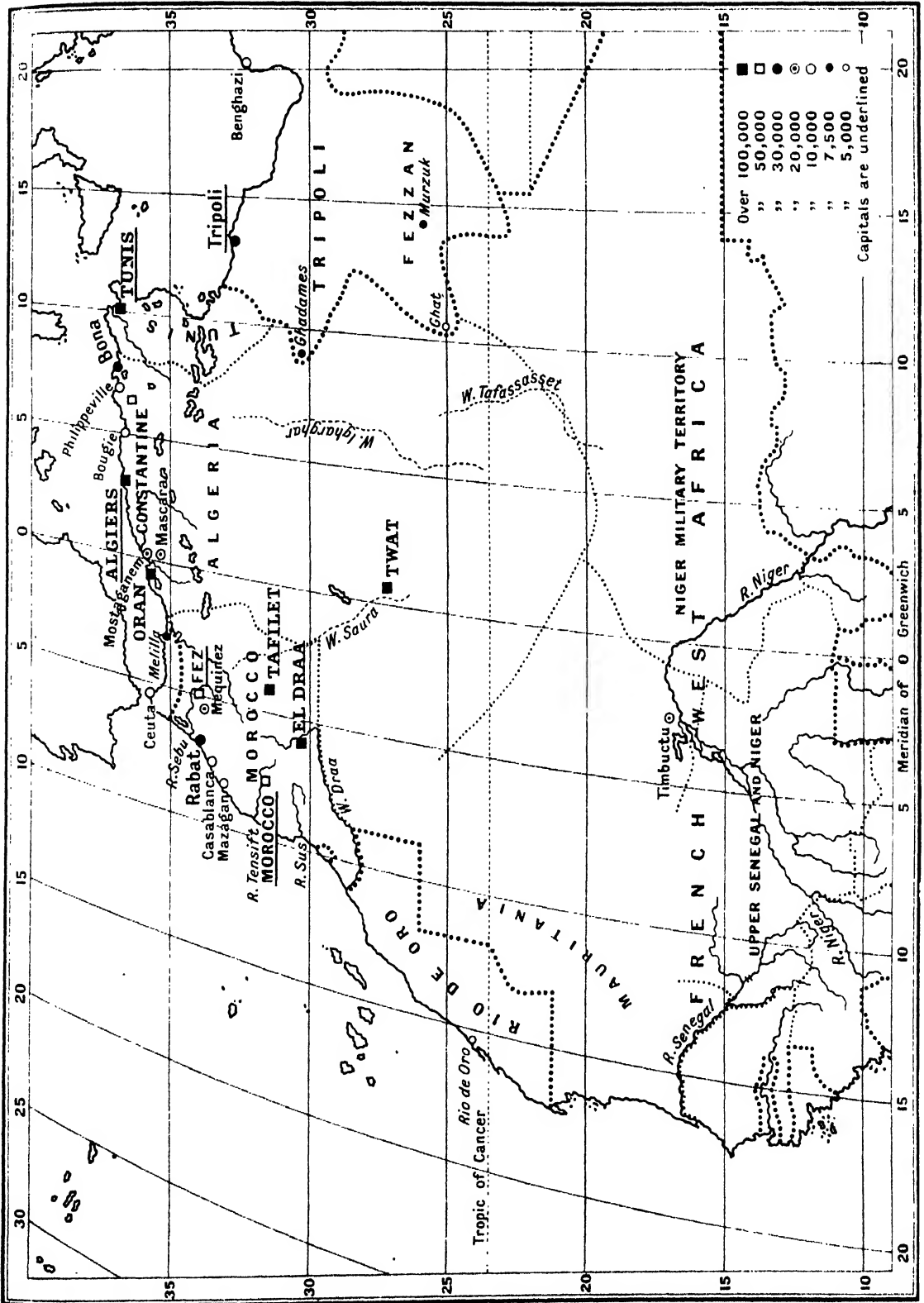
In Chapters II. and IV. the extension of the German Kamerun colony southwards and eastwards has been noted. France ceded these extensions to Germany in exchange for the withdrawal of the opposition of that nation to France establishing a protectorate in Morocco.

The French government of *Algeria* is under a Governor-General, who controls the expenditure and taxation with the assistance of an advisory council. The excellent government has produced a remarkable development of trade within the last fifty years. *Algiers* is the chief port and also the capital.

Tunis also forms a French protectorate, and the army and judicial affairs are under the control of that people. The nominal head, known as the Bey, is a Mohammedan, and acknowledges the suzerainty of the Sultan of Turkey.

Tunis is the capital, and *Bizerta Bay* is an important naval and military station.

Tripoli, which until 1912 was a province of Turkey, is now practically under Italian control, the Turkish army and civil officials being withdrawn by the Turkish-Italian treaty. The Turkish power is now limited to the control of the religious affairs of the Mohammedans.



NORTH-WEST AFRICA—POLITICAL.

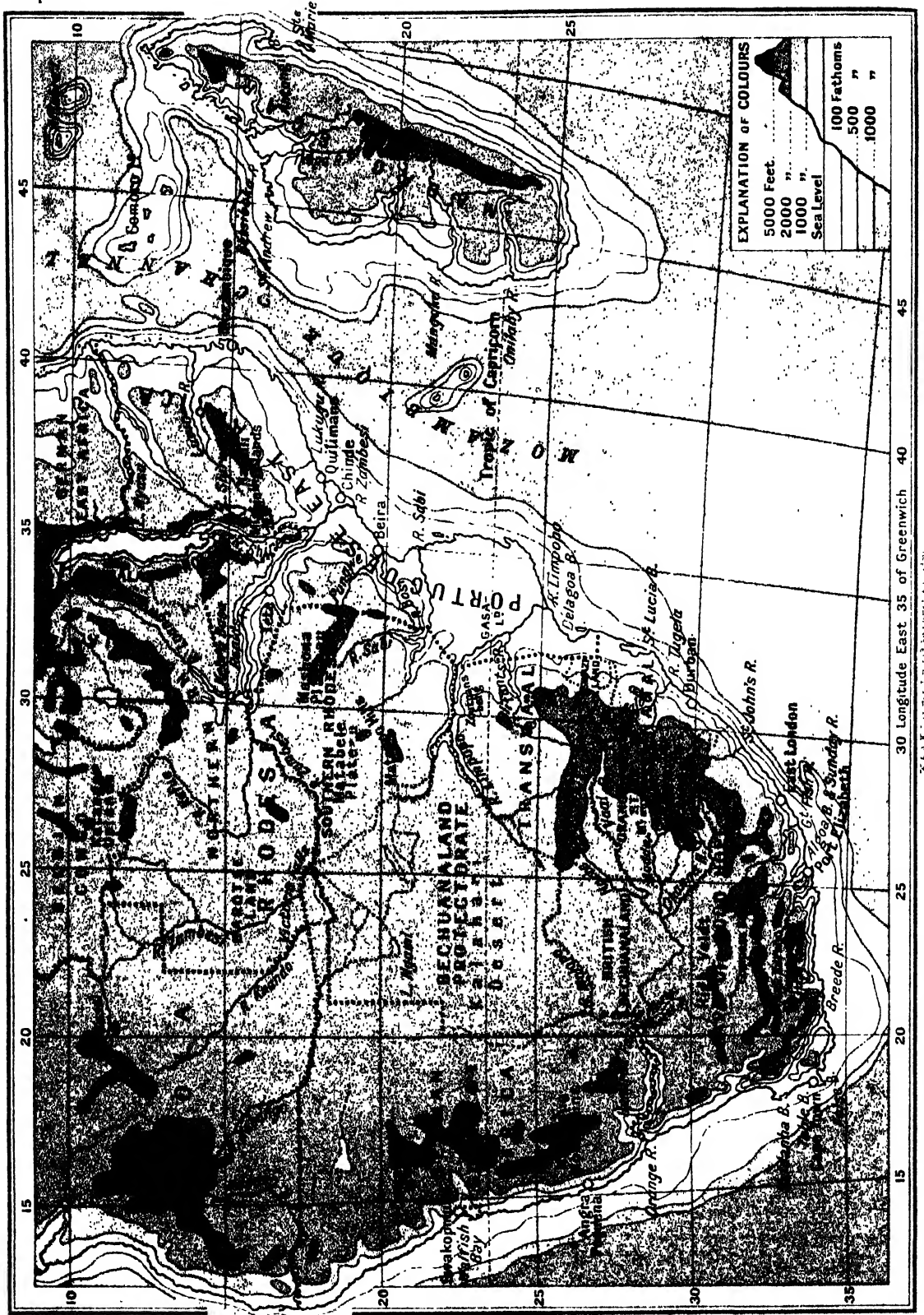
Sahara.—By an agreement between France and Great Britain the whole Sahara west of the Libyan Desert, with the exception of the small Spanish state of Rio de Oro, is controlled by the French. This state extends along the Atlantic seaboard from the Moroccan boundary southwards to Cape Blanco.

The Spanish Canary Islands lie opposite the shores of Rio de Oro, and the Governor of the islands administers the state on the mainland.

EXERCISES.

1. Show how the distribution of population in the Sahara is determined by the distribution of vegetation.
2. Describe the chief characteristics of the Berber peoples, and name the parts of Northern Africa which they inhabit.
3. Account for Negro peoples (1) in the oases of the Sahara, and (2) in Morocco and Tripoli.
4. Show how far geographical causes were responsible for the importance of Carthage in early historical times.
5. Name the chief events which led to the French control of Morocco in 1912.
6. State the position of Bizerta Bay, and compare its importance with that of Malta.
7. Draw a map of Africa north of the Congo Basin, and show by two different kinds of shading the areas controlled by France and Britain.
8. Turkey's control in Africa is now only nominal. Discuss this statement.

Map 22.



Natural Scale 1: 21,225,000 or 335 miles to the inch

Scale of Miles 0 100 200 300 400 500 600 700 800 900 1000

AFRICA.

CHAPTER VI.

AFRICA SOUTH OF THE CONGO.

CONTENTS.

Position.
Seas and Coasts - Islands.
Surface: Zambesi Basin -- Matoppos Hills --
Limpopo Basin -- Portuguese Coastal
Plain -- Orange Basin -- Kalahari Basin --
Highlands of the West -- Plateau Escarp-
ments -- Madagascar.
Climate -- Climatic Regions.
Flora -- Fauna.
Minerals -- Manufactures.
Routes -- Commerce, Seaports, Trade
Centres.
Distribution of Population -- Native Races --
History and European Settlement -- Political
Divisions.

MAPS.

22. Orographical Map of Africa South of the
Congo.
23. Showing Minerals and Manufactures.
24. Transparent Route and Production Map.
25. Showing Political Divisions.

Position.

As the continent of Africa lies athwart the equator, similar climatic regions exist both north and south of it. Those to the south of Equatorial Africa are, however, modified by the tapering of the continent towards the south and by the influence of the wide oceans. The *Zambesi River* occupies a position similar to that of the *Niger*. Both flow through a plateau region having summer rains, and hence the basin of the former is often known as Southern Sudan, while in some respects the coastal plain of Portuguese East Africa resembles that of the Guinea Coast. The inland drainage to Lake Tchad is repeated south of the equator in that of *Lake Ngami*, and just as the drainage system of the *Niger* is closely connected with the northern lake, so is that of the *Zambesi* related to that of *Ngami*. Owing to the South-East Trade Winds blowing from a wide ocean and meeting the steep escarpments of a tapering continent, the semi-desert conditions of the *Kalahari*, limited to the west of the continent, form a much lesser obstacle than does the Sahara in the north. Lastly, the Mediterranean conditions of the

Atlas Region are repeated in the district surrounding *Cape Town* in the far south-west of the continent.

Madagascar having climatic conditions similar to those of the opposite mainland, and connected with it in structure through the *Comoro Islands*, will be studied with this region.

Politically the greater part of this area is under British control, and the close connection between the routes and commerce of the different states is the chief reason why such an extensive area forms the subject matter of this chapter.

Find on the map the British provinces of the *Cape of Good Hope*, *Natal*, *Orange Free State*, and *Transvaal*, also the *Bechuanaland Protectorate*, *Northern and Southern Rhodesia*, and *British Nyasaland*.

The remaining areas in this region include the long coastal province of *Portuguese East Africa*, which borders Rhodesia and part of the *Transvaal*, and *German South-West Africa*, which borders the coast between the Cape of Good Hope Province and Portuguese Angola.

Seas and Coasts.

Observe on Map 22 that the eastern coast, washed by the Indian Ocean, is bordered by a wide continental shelf, corresponding to the width of the Portuguese Coastal Plain. Farther south the narrow coastal sill has a correspondingly narrow shelf. The *Mozambique Channel*, which separates this continent from the large island of Madagascar, has a similar shallow sea area bordering the western lowlands of that island. Hence the deep-sea passage in this channel is narrowed to less than half of the distance between the two shores. In the far south, between *Port Elizabeth* and *Cape Town*, the continental shelf widens considerably, and this shallow sea area is continued along the Atlantic shores of the west coast, which have but few indentations. The eastern shores are washed by the warm *Mozambique current* from the equatorial regions, while those of the Atlantic receive the cooling effects of the *Benguela current* which flows northward towards the equator.

North of the Zambesi mouth the north-east trend of the coast and the more northerly direction of the plateau escarpment cause wide alluvial plains, built up largely of the sediment brought from the plateau edges by the coastal streams. This coast-line, washed by the Mozambique current, is carved into numerous bays and inlets, which, before the influence exerted by Portuguese bad government, were busy harbours.

Farther south the current flows parallel with the shore, Madagascar serving as a breakwater. Hence along the coasts of Gasaland there are few harbours till *Delagoa Bay* south of the Madagascar breakwater, and barrier reefs and islands of coral formation border the shore.

South of this, to the mouth of the *Tugela*, is a zone of low-lying coast-lands containing numerous large lagoons, the chief being *St. Lucia*, about 55 miles long and 10 broad, and joined to the sea by a narrow channel.

Still farther south the plateau nears the coast and the plain is consequently narrower. There are few indentations and no good harbours. Even *Durban*, situated on an inlet protected by a bluff, is blocked by a sand-bar at its entrance, and at low tide passengers are disembarked into small steamers.

The south coast has an inhospitable sea-

board deficient in harbours, many of them unprotected, while the river mouths are blocked by sand-bars. Hence the only three ports capable of accommodating shipping are *Cape Town*, *Port Elizabeth*, and *East London* (the second on *Algoa Bay*). At the south-west corner the *Cape Peninsula* causes *Table Bay*, opening to the north and now protected from the westerly gales by a breakwater. *False Bay* with *Simon's Bay* opens south, and contains the naval station of *Simonstown* (see fig. 12).

Along the west coast *Saldanha Bay* has a good harbour, but the difficulty of obtaining fresh water has prevented its development. The coast north of the Orange estuary and extending to the borders of Portuguese Angola possesses few good harbours. The Benguela current running northward here brings sediment to silt up the harbours of *Angra Pequena* and *Walfish Bay*, while the German port of *Swakopmund* is only rendered valuable by artificial harbour works.

Islands.

Notice that the large island of *Madagascar* forms a long, irregular ellipse having a north-east to south-west direction roughly parallel with the opposite shores. This island, having twice the area of the British Isles, is the largest belonging to Africa, and is only exceeded in size by Australia, New Guinea and Borneo. Observe on the map the wide *Mozambique Channel*, 225 miles wide in its narrowest part from *Mozambique* to *Cape St. Andrew*. In the northern part of this channel notice the submerged ridge upon which stand the *Comoro Islands*. These, like Madagascar, are a French possession, and form a mountainous, volcanic chain extending 150 miles across the channel, and rising in *Grand Comoro* to 8500 feet. They form the connecting link between Madagascar and the mainland, of which in very remote geological ages the island formed a part.

The *Comoro Islands* are all extremely fertile, and yield *coffee*, *cotton*, *sugar*, *vanilla*, *cocoa-nuts* and *cloves*. The coral atoll of *Aldabra*, north of this group, is noted for its gigantic turtles.

The 3000 miles of coast-line of Madagascar present a very regular aspect. The east coast runs in almost a straight line, broken only by *Antongil Bay* and the

islet of *St. Marie*, but the north-west coasts are indented by many spacious inlets, some of which are land-locked and of commercial value.

For further description of this island see Surface, Climate, Productions, etc., of South Africa.

EXERCISES.

1. Divide Africa into natural regions. Draw a comparison between those north and south of the equator, giving reasons for any points of difference you mention.
2. Show how Madagascar is linked to the African continent.
3. From what drawbacks to her external trade does the southern half of the African continent suffer?
4. Describe the exact position of Cape Town. Show in what ways position has made it important.

Surface.

The plateau formation of Africa is continued south of the Congo and the Eastern Equatorial provinces to the far south of the continent, the terraced escarpments bordering the steep eastern and southern edges being very clearly defined. The so-called mountain ranges of the east are the buttress edges of the plateau, and from the sea appear as lofty ranges, but they descend on the interior side to the plateau, which slopes gradually westward. This gradual slope is broken in some places by resistant masses of rock, which have defied the wind erosion to which the surface features are largely due. In some places these form isolated hills, and in others transverse ranges running in an east and west direction. These latter help us to divide this area into natural divisions for purposes of study.

The Zambesi Basin.

The low, indefinite water-parting, already referred to in Chapter II., between this river and the Congo, borders this basin on the north, while the higher lands north of Lake Nyasa separate its drainage from that of the remainder of the Eastern Plateau. On the west the *Bihe Plateau* of Portuguese Angola forms the water-parting between the coastal streams and those draining north to the Congo or south to the Zambesi. In the south-west the intermittent drainage to Lake

Ngami is closely connected with that of the Zambesi, while the steep slopes of the *Matoppo Hills* form a water-parting between this river and the *Limpopo* on the south-east.

The plateau surface on the northern border is deeply trenched by the Zambesi tributaries and the rift valley of *Lake Nyasa*. The highest part is east of the *Shire River*, where *Malanje*, an isolated block mass, rises to 9500 feet above sea-level.

The *Zambesi*, 2000 miles long and draining a basin of 500,000 square miles, is the only large river which flows eastward across the plateau. The other east coast streams, with the exception of the *Limpopo*, drain the steep edge of the plateau to the plain, while the Zambesi has the greater part of its course on the plateau. The low water-parting between this river and the Congo causes much of the drainage to alternate between the two rivers.

Notice on the map that the Zambesi rises on the far north-western border of Northern Rhodesia near to the Kasai tributary of the Congo, and then flows in a southerly direction till its confluence with the *Kuando*, rising in the higher lands of Portuguese Angola.

South-west of the *Kuando* or *Chobe* notice the *Kubango*, which flows south-eastward towards Lake Ngami. This river is largely intermittent in its supply, and one time formed a tributary of the Zambesi, but a decreased rainfall causes it now to send the greater part of its waters to the depression of Lake Ngami.

Lake Ngami, to which flow a number of intermittent streams, is a shallow lagoon, varying considerably in size with the season, and during high floods having communication with the Zambesi. The *Kubango*, its largest feeder, drains intermittently to the *Chobe* of the Zambesi and to this lake.

The whole of this area probably once formed a vast lake (similar to that of the Congo Basin), emptied eastward by the Zambesi, which cut a gorge through the Eastern Plateau. The numerous salt depressions to be noticed on the map supply evidence of this.

In the upper part of its course the river is navigable for 1000 miles, but beyond its confluence with the *Chobe* it turns east across a plateau of volcanic basaltic rock

and descends over the famous *Victoria Falls* (400 feet high) into a zigzag gorge only 400 feet wide.

From *Victoria Falls* the *Zambesi* flows east through savannah lands, descending the plateau terraces by gorges and rapids to *Tete* below the *Kebra Basa Rapids*, from which point it is navigable to its delta on the Portuguese East African coast.

Trace on the map the chief tributaries which flow to the *Zambesi* from the north.

The *Kafue*, rising not far from the *Luapula* or Upper Congo, has a long winding

railway), it provides a route inland to the Equatorial Plateau.

Lake Nyasa, 350 miles long, occupies the southern extension of the rift valleys of the Eastern Plateau, and is bordered on the east by the *Livingstone Mountains*, 10,000 feet high, while its outer and lower western slope drains to the *Loangwa* tributary of the *Zambesi*. The lake itself, though a little smaller, resembles *Lake Tanganyika*, both occupying the floor of the rift valley. The *Livingstone Mountains* approach quite close to the water's edge on the north-east, but on the west lies a bordering

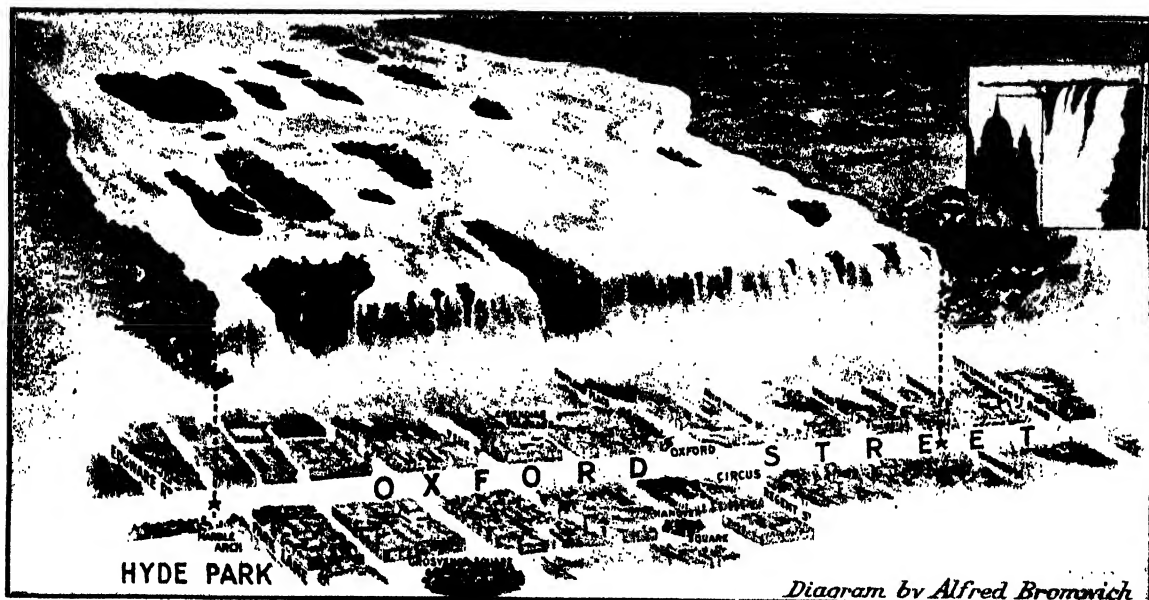


Fig. 10. —Sketch comparing the width of the *Victoria Falls* (1 mile, 169 yards) with the length of *Oxford Street*, London. The Inset compares the height of the Falls with *St. Paul's Cathedral*.

course of 800 miles from the *Katanga* uplands, while a descent of 3000 feet causes it to be obstructed by many rapids. It drains an area of 70,000 square miles, and carries a large volume of water to the main stream.

The *Loangwa*, which rises on the plateau between *Nyasa* and *Tanganyika*, flows in a south-west direction to join the river at *Zumbo*. Its swift current renders it unnavigable.

The *Shire* is by far the most important tributary, carrying the excess waters of *Lake Nyasa* to the main stream, and, except for the 50 miles of *Murchison Rapids*, where it cuts through the *Blantyre Highlands* (now avoided by a

plain with an average width of 6 miles. *Lake Shirwa*, to the east of *Lake Nyasa*, is a salt-water lake having no connection with the drainage to the *Zambesi*.

The *Victoria Falls* are called by the natives "*Mosi-o-a-tunga*," or "*Smoke that sounds*," because of the enormous clouds of spray and the roar of the water, which are both felt and heard miles away. The Falls are higher and possess a greater volume of water than those of the famous *Niagara*. A mighty river, over a mile in width, descends 400 feet into a narrow ravine, known as the *Boiling Pot*, and is shut in by massive walls on either side, from which the water escapes by a zigzag ravine which

it has carved through the hard rock on either side.

On the south the Matoppo Hills have their steep slope to the north, and hence the numerous streams which drain from them to the main river are too rapid to be of any importance. The *Delta* is not good for navigation owing to its constantly shifting mouths and the silting up of mud. Only two of its eight channels are navigable—the mangrove-bordered *Chinde* and the winding *Quilimaine*.

Comparison between the Niger and the Zambesi:—

- (1) Both flow for the greater part of their courses across a plateau, and descend by waterfalls to a malarial coastal plain.
- (2) Both in their upper courses move slowly towards a desert region of little rainfall, losing much water by evaporation, and then make a sharp turn to flow across rich savannah lands having summer rains.
- (3) Both are closely connected with basins of inland drainage. The Niger tributaries nearly meet those of Lake Tchad, while those of the Zambesi are connected in the flood season with those of Lake Ngami.
- (4) Both have deltas where they enter the sea, many of their mouths being rendered unnavigable by the shifting nature of the channels and by the silting up of mud.
- (5) Both have upper navigable courses separated from a lower navigable courses by rapids.

The Matoppo Hills.

Between the Limpopo and the Zambesi the plateau formation has an average elevation of from 3000 to 4000 feet, across which, for a distance of 400 miles, the Matoppo and Mashona Highlands run in a north-east direction from *Tati* to *Mt. Hampden*. These form a distinct water-parting between the streams flowing north-west to the Zambesi and those flowing south to the Limpopo or east through Gasaland towards the Indian Ocean. The mountains fall abruptly to the low-lying Lower Zambesi Basin and to Gasaland on the east, but towards the south the slope is more gentle.

The granite kopjes, consisting of hard granite cores able to withstand erosion, present a striking feature in this area. Immense

blocks of granite piled up in many fantastic forms reach to the Matoppo Hills, while quartz reefs rich in gold crop out in the valleys between these granite hills.

The Basin of the Limpopo.

As the Matoppo Hills form the water-parting between the Zambesi and the Limpopo, so, on the south, another similar ridge, known as the *Witwatersrand*, serves as a water-parting between the drainage of the Vaal and Limpopo. The latter river rises in this range, and makes a great, semicircular bend of 1000 miles between Pretoria and Delagoa Bay, draining an area larger than that of the British Isles. Owing to deficient rainfall the volume of the river is small in comparison to its size.

Map 22 shows that north of the *Olifants River* the buttress edges of the plateau are much lower, and form a number of detached masses, such as the *Zoutpansberg*. Hence, the rivers which break through the barriers here are not of such a torrential nature as the more southward flowing streams. The Limpopo breaks through the Zoutpansberg, while its largest tributary, the Olifants, cuts the barrier much farther south.

From the Matoppo Hills the Limpopo receives numerous streams, many of which are intermittent, and these cause the volume of the river to be small and variable.

During its course through the coastal plain it crosses a swampy region infested by tsetse flies, which, together with sandbanks obstructing the mouth, renders the lower course of the river almost valueless commercially.

The Portuguese Coastal Plain.

The lower course of the Zambesi divides this plain into two. The wider, coastal plain to the north of it contains many isolated granite mountain masses, such as the *Namuli Highlands*, which form the water-parting between the *Lukuga*, *Lurio*, *Lakunga*, and other rivers.

South of the Zambesi the plateau escarpment is almost parallel with the coast, and the ground slopes from a height of 6000 feet at the edges of the Matabele and Mashona plateaux to the coast. This area is watered by three considerable streams—the

Pungwe, *Bosi*, and *Sabi*—all of which rise on the coastal slopes of the plateau.

Of these, the largest is the *Sabi*, whose broad channel is navigable for small craft throughout the coastal plain to the Rhodesian border, the *Pungwe* valley being used by the railway inland from *Beira* to Southern Rhodesia.

The Basin of the Orange.

From a study of the map it will be noticed that the remainder of the plateau south of the Limpopo forms the immense basin of the Orange River. Observe that this river basin, having an area equal to three times that of the British Isles, includes the drainage of the Drakensbergs on the east, the Witwatersrand on the north-east, the Kalahari on the north, and even the intermittent drainage of the Damara and Namaqua tablelands on the west, while the plateau edge known as the *Nieuwveld Mountains* forms the water-parting on the south between the coast rivers and those flowing north to the Orange. The whole of the plateau forming this basin has a gradual westerly slope towards the Kalahari Desert, from which on the western side rise the higher lands of Damaraland and Namaqualand, southern continuations of the plateau formation of Angola.

The *Orange River*, 1300 miles long, rising high up in the borders of Basutoland, flows the whole width of the plateau, and for some distance forms the boundary between the Orange Free State and the Cape of Good Hope Province. The high mountains of Basutoland, often called "the Switzerland of South Africa," separate the upper course of the Orange from that of its tributary the *Caledon*, which, rising near *Mont Aux Sources*, flows south-west and forms the boundary between the Orange Free State and Basutoland. Farther to the west is the confluence of the *Vaal*. This river, separated from the basin of the Limpopo by the cross ridge of the Witwatersrand, forms for much of its course the boundary between the Orange Free State and the Transvaal, while its sub-tributaries, the *Hart* on the right bank and the *Modder* on the left bank, drain the Transvaal and Orange Free State respectively.

Below the confluence of the *Vaal* the river flows through a region where it loses so much water by evaporation during the dry

season that it becomes unnavigable even for small craft. On the right banks of the river notice the large, intermittent drainage system of the *Hygip-Molopo*, which includes in its area most of the Kalahari Desert, and on the south the intermittent drainage of the *Hartebeeste*.

In the lower part of its course its navigation is impeded by the *Hundred Falls*, a gorge 16 miles long, in which the river descends 400 feet by a series of cascades, while its mouth, 25 miles farther down, is obstructed by a dangerous bar, against which the surf breaks with such force as to prevent shipping.

The main stream and its tributaries cut deep valleys into the land, which during the wet season are filled with roaring torrents, making them almost impossible to cross. In the dry season they become trickling water courses difficult to ford because of the steep sides of the valleys. These rivers therefore are of no value commercially, and have at all times proved an obstacle to movement. Notice, from the map, that, as a consequence of this, the rivers Orange, Molopo, Vaal, and Caledon form political boundaries.

The *Koppies* of the plateau are isolated hills which have defied the dry wind erosion which has lowered the level of the plateau. They sometimes consist of flat-topped hills of quartzose sandstones, or more rounded peaks of granite formation, breaking the generally monotonous level, and rising some 1500 or 2000 feet above the plateau, which has an average height of 3000 feet above sea-level.

The Kalahari Desert.

The transition from the grassy steppes of the Transvaal to the more arid desert wastes of the west is very gradual, and not marked by any notable physical feature. The railway from Cape Town northwards through Mafeking to Bulawayo forms a dividing line between the more fertile areas of the east and the desert conditions of the west. The Kalahari proper is bordered along its eastern margin by a sandy belt forming lines of dunes running in a north and south direction, and this obstacle to progress has caused false impressions of the true Kalahari. In no respect is it a desert proper, only the decreased rainfall within historic times being responsible for its arid conditions. It is

covered largely with scrub, but in some places there are fine pasture lands, while in others agriculture is possible.

Most of this area is drained southward, and forms the Hygap - Molopo tributary system, but this is separated from a northern drainage to Lake Ngami by the slopes of the Bechuanaland Plateau.

This area, like that of the Barotse country of the Upper Zambesi and the Ngami Basins, probably once formed the remains of a great lake basin, of which the salt pans

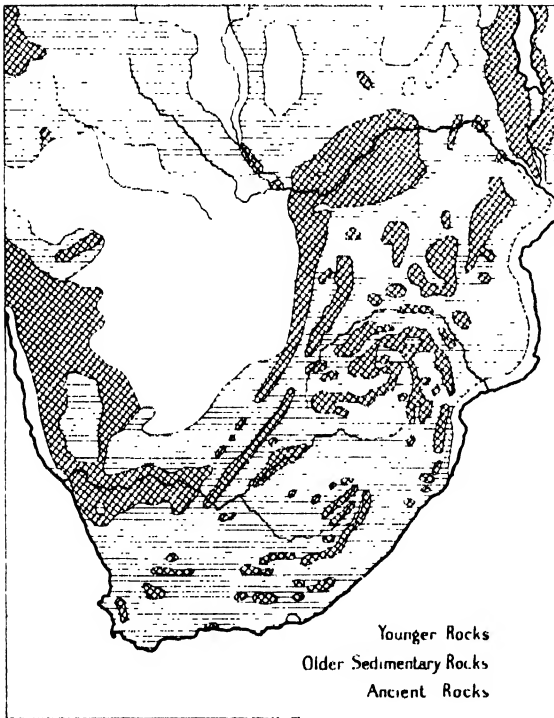


Fig. 11 - South Africa, Rock Structure.

are fragmentary remains. In past ages these lakes were drained by the Zambesi and the Orange River systems, when the whole area, like that of the Sahara, had a more copious rainfall. This greater moisture can be proved by the decaying remnants of forest trees which are still to be seen, and also by the cretaceous deposits which now cover large parts of this region. The red, sandy loam which now covers large areas is porous, and the waters disappear through it to underlying dykes of igneous formation where underground reservoirs are formed.

The Highlands of the West.

Notice on the map the higher lands which border the western coast. These are a continuation of the plateau formation of Angola through German South-West Africa, and extending south of the Orange River into the Cape of Good Hope Province. South of the *Cunene River* the true plateau formation disappears, and these highlands form a broad crest with its axis parallel to the coast, reaching its culminating point near Walvis Bay. In the southern half this crest has been worn by denudation into chains of hills, which are continued beyond the Orange, and there rise to 3500 feet.

Much of the coast is bordered by dunes probably of marine formation, and moulded to their present condition by the wind.

The whole of this area is drained by intermittent streams which flow direct to the Atlantic, or inland to one of the numerous salt lagoons, or towards the Hygap-Molopo drainage of the Orange.

The Plateau Escarpments.

South of the Limpopo the terrace formation characteristic of the higher eastern edges of the plateau is very clearly defined. Observe on the map that the *Drakensbergs*, continued by the *Stromberg* and *Nieuwveld* ranges, form the southern and eastern border of the plateau, and the steep descent from these to the coastal plain is by two clearly marked terraces known as the *Great* and *Little Karroos*, the sides of which are buttressed by mountain systems. From the coast these appear as parallel ranges of mountains increasing in height towards the interior, but seen from the Veldt and the Karroos they do not appear so elevated. The rivers which drain from this steep eastern slope and flow to the coast have to force a passage through the buttress edges of the plateau in their rapid course seaward. Hence these terraces present obstacles to navigation, which obstacles are further increased in the courses of the rivers across the arid Karroos, where much water is lost by evaporation. By far the largest of these rivers is the *Tugela*, which, with its large tributary the *Buffalo*, drains a great part of Natal, but south of this are numerous other streams, the chief being the *Great Fish River*, the *Sunday River*, which flows from the foot of *Compass Berg* to *Algoa Bay*, the *St. John*,

which, although not so rapid, is blocked by sandbanks at its mouth, and the *Breede River*, flowing from the highlands of Cape Town.

In the Cape of Good Hope Province the coastal plain is from 12 to 50 miles wide, and is crossed by many mountain spurs, which terminate in such headlands as Cape Agulhas. Stretching from False Bay to Algoa Bay is the buttress edge of the Little Karroo, known as the *Large Berg*, and rising to 3000 feet. The Little Karroo is bordered on its land side by the *Zwarte Berg* or *Black Mountains*, which, rising to 5000 or 7000 feet, form the wall of the Great Karroo, from which again rise the *Stormberg* and *Nieuwveld* ranges to the edge of the plateau proper or *Veldt*.

The seaward slopes of all these hills, covered with vegetation, present a striking contrast to the arid grass lands of the Karroo, which are devoid of rain. The soil on these Karroos, and also of much of the Veldt, consists of sands and clays, the latter baking as hard as bricks in the dry season. These rest on a bed of blue slate, which forms a water-bearing strata, and thus the numerous bulbous root plants, so characteristic of the Veldt, are kept alive.

The *Drakensbergs*, 8000 to 10,000 feet above sea level, present an imposing appearance from the coast, but on their landward side they descend to the plateau, which here is 4000 feet above sea level. *Mont Aux Sources*, one of the highest peaks, is a flat-topped mountain situated at the converging point of the boundaries of the Orange Free State, Basutoland, and Natal. It forms the water-parting between the streams flowing west to the Orange and east to the coast.

The rivers which drain these escarpments cut deep ravines, known as *Kloofs*, into the buttress edges of the terrace plateaux, and on these slopes form mountain torrents. Even across the terraces their course is so rapid as to make them impossible of navigation by river craft.

Nearly all the mountain ranges bordering the plateau on the south and east consist of granite rocks upon which enormous masses of quartzose sandstones, sometimes 2000 feet thick, have been formed into flat-topped hills. The whole of this area, and also interior plateau, show signs of great internal disturbance, which has brought the older rocks to the surface.

Table Mountain:—

In the far south-west corner of Africa between *Helena* and *False Bays*, and terminating in *Cape St. Martin*, exists a remnant of an ancient range. To this belongs the flat sandstone *Table Mountain*, which rises from a granite base to a height of 3500 feet, bordering the bay of the same name on its eastern side.

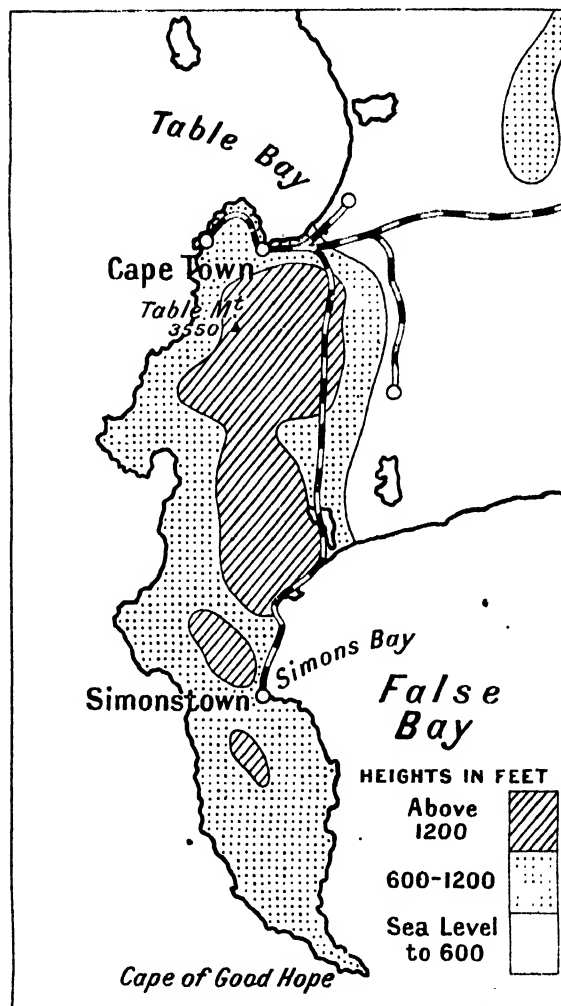


Fig. 12 --The Cape Peninsula.

Table Mountain is on a small peninsula separated from the mainland by a sandy isthmus. To the west of this is the *Lion Mountain*.

Madagascar.

The main surface feature of the island is a long plateau extending through the whole

length. This is 4000 feet high, and has a precipitous descent to the east and a more gradual one to the west. From its edges many ranges attain a further elevation of 4000 to 5000 feet, while transverse ridges cut the plateau into several secondary tablelands. These, covered with grass, exhibit a striking contrast to the forest-clad slopes and plains.

As a consequence of the surface, the rivers draining to the east coast are shorter and more rapid than those flowing to the opposite shore. Some of these latter are navigable for a considerable distance.

The eastern escarpments consist of parallel ridges with very steep inclines separated from each other by troughs, and the traveller inland from Tamatave on the east coast to Antananarivo must cross by zigzag gorges to reach the plateau. The more gradual incline to the west is, however, nearly as difficult owing to the dense forests and deep swamps.

The edges of the plateau form sharp divisions between the granites and igneous rocks of the tableland and the younger limestone, sandstone, and other sedimentary rocks which constitute the surface of the slopes and plains. The whole island has been the scene of great internal disturbance. Many of the mountains are the craters of long extinct volcanoes, from which ancient lava streams can now be traced for several miles by their dark surfaces, which contrast sharply with the adjacent red clays. Although this volcanic action is now extinct, earthquakes are common, and prevalent hot springs tell of internal forces still at work.

EXERCISES.

1. Describe the water-parting which separates the river basins of the Zambesi and Congo. Illustrate by a sketch map, and insert in it the tributaries draining either side of the water-parting.
2. Describe the Zambesi, and draw a comparison between this river and the Niger.
3. Describe the Shire River and Lake Nyasa. Show how these form a link between this region and that of Equatorial Africa, and how they provide natural routes into the interior.
4. Show why the rivers of South Africa are of little use for commerce. Name the chief rivers forming political boundaries, and give reasons for same.

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5. Describe the formation of the isolated kopjes and transverse ridges which cross the plateau. Show how the latter assist in dividing South Africa into natural drainage regions.
6. Describe the Orange River. Explain why a river which drains such an enormous basin has not a great port at its mouth.
7. Draw a map of the Orange River Basin. Insert the main stream and its tributaries, and the water-partings which separate the drainage from that of the adjoining basins.
8. Describe the Kalahari Desert. Draw a comparison and contrast between it and the Sahara.
9. Describe the surface features and drainage of the plateau escarpments and the bordering coastal plain.
10. Describe the chief surface features and rock formation of Madagascar.

Climate.

Figs. 13 and 14 show the climatic conditions in summer and winter. In the former, observe that the migration of the sun's vertical rays south of the equator during southern summer causes the belt of greatest heat, and therefore of lowest pressure, to lie south of the equator. Into this low-pressure area blow the South-East Trades, carrying heavy rains to the eastern coastal plains and terraced escarpments of the plateau, but decreasing towards the interior and the west coast. The Zambesi Basin experiences the heavy rainfall of the Equatorial Belt of Calms, which has shifted southward with the migration of the sun's vertical rays.

Comparing fig. 13 with fig. 14 we notice that in winter (July conditions) the migration of the sun's vertical rays north of the equator causes a decrease in temperature over the land, and, with the northerly migration of the Belt of Equatorial Calms, a consequent northerly movement of the South-East Trades. Hence, the far south of the continent feels the influence of the Westerly Storm Winds, which, blowing from a wide ocean, and little obstructed by land masses, bring a fair amount of moisture to the district around Cape Town. The South-East Trades still blow upon the coastal plain and terraced escarpments of the south-east coasts, but owing to a high-pressure region on the plateau these winds are not carried inland, and the whole plateau has a dry season.

Fig. 13.—Mean Rainfall for Six Months (November to April). Isotherms and Isobars for January.

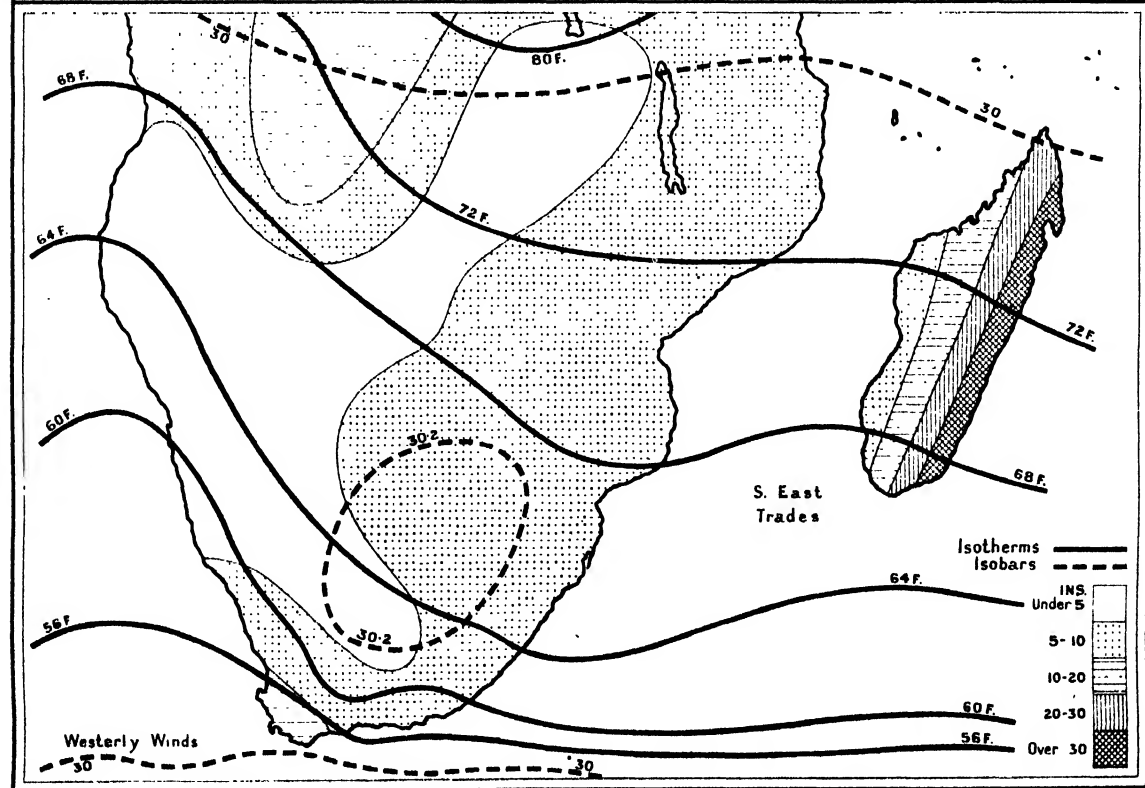
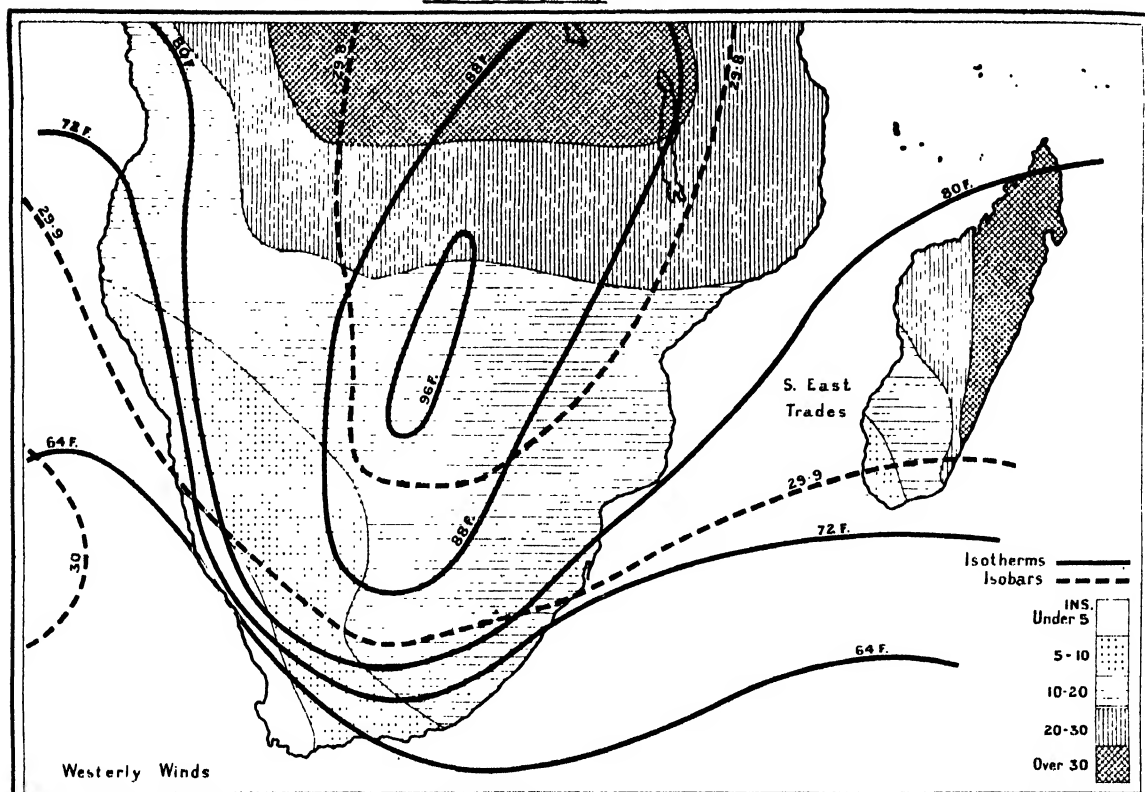


Fig. 14.—Mean Rainfall for Six Months (May to October). Isotherms and Isobars for July.

The isotherms and isobars in these diagrams are reduced to sea-level, hence the temperature and pressure conditions shown, ignore the effect of elevation. This elevation is an important factor in the future development of the region, because the 4000-foot contour line appears to be the limit of malarial fever. The greater part of Southern Rhodesia is thus capable of white occupation, while the Matabele Plateau between the Limpopo and the Zambesi, the Shire Highlands, and the lands bordering the northern tributaries of the Zambesi possess some of the finest climates in the world. These are in striking contrast with the lands of the Upper and Middle Zambesi (once occupied by a vast lake), the lower lands bordering the tributaries and the coastal plains of Portuguese East Africa, all of which are distinctly unhealthy and unsuitable for white occupation. Farther south the slopes from the coastal plains of Natal to the plateau escarpment are marked by different zones of climate, varying from tropical, through subtropical and warm temperate, to cool temperate lands on the edge of the plateau.

Figs. 13 and 14 show that the west coasts have a much lower temperature than the east coasts in similar latitudes. This is due to the influence of ocean currents, the west being cooled by the Benguela current from the south, the east warmed by the Mozambique current from equatorial regions.

Climatic Regions.

From this study of climate we can divide South Africa into the following regions:—

Cape Town Region:—

This has South-East Trades bringing little rain in summer, and warm, wet Westerly Storm Winds carrying heavy rains in winter.

In summer the South-East Trade Winds, rising to get over Table Mountain, condense, and cause a mist (known as the table-cloth) to hang over it. This descends upon the western slope to Cape Town. In winter a similar mist is caused by the west winds, but in this case the mist rolls down on the opposite shore to Simonstown.

Compare this typical Mediterranean climate with that of the Atlas Region in the far north-west, which lies in similar latitudes.

The Coastal Plain and Terraced Escarpments of Natal and the South-East of the Cape of Good Hope Province:—

These obtain rain all the year from the South-East Trades, which rise to the cold upper layers of the atmosphere to get over the lofty edges of the plateau. This rainfall is increased in winter, when a low-pressure area on the interior plateau draws more moisture inland.

The zones of climate, due to elevation, have already been referred to. The damp heat of the coastal plain is unhealthy, but the mountainous interior, having a cooler climate, is favourable to European settlement.

Contrast the effect of the South-East Trades, which, coming from a wide ocean and meeting the steep escarpments of the plateau, bring heavy rains to this region, with the dry North-East Trades, which, crossing the land mass of Asia and meeting no lofty obstacles, bring no moisture.

The Southern Plateau or Veldt:—

This has summer rains and dry winds in winter. The great heat, and consequent low pressure, cause the South-East Trades to blow inland to the plateau in summer, giving rain to its eastern part, which moisture, however, decreases rapidly towards the west. In the winter this plateau is cold, and the consequent high-pressure belt causes outflowing dry winds.

The decrease in rainfall is shown by the following averages. On the coastal plain the mean annual rainfall is 42 inches, on the eastern edges of the plateau 30 inches, while in the west of the Transvaal this decreases to 12 inches.

The elevated plateau, owing to its lack of moisture and exposure to cool southern winds, has an exceptionally healthy climate. The summer temperature seldom exceeds 90° F., and the winter seldom reaches freezing-point, although snow falls in some parts.

The Kalahari and the West Coast:—

This region is practically devoid of rain, except a small amount on the higher lands in summer.

The far northern border of German South-West Africa feels the influence of the

equatorial rains in southern summer, but the absence of rain over most of this area, and the extremes of climate acting on the surface, create the desert conditions of the Kalahari. This resembles the Sahara in being within the belt of the Trade Winds, but differs from it in size (only being as large as England) and in the underground supplies of water which cause it to be covered with grass.

Rhodesia :—

The migration of the Equatorial Belt of Calms southwards gives this area summer rains. The effects of proximity to the equator are nullified by the elevation of the greater part of this region. The dry winter, having bright, sunny days succeeded by only slight frosts at night, is the best season.

The low lands in the river valleys tend to be malarial in the flood season, and are consequently unsuitable for European settlement.

Compare the plateau of Rhodesia with that of the Niger Basin. In both cases they approximate to desert conditions on their borders which are farthest removed from the equator.

The Coastal Plains of Portuguese East Africa :—

This area of summer rains and excessive heat forms for the most part a low-lying, marshy coastal plain abounding in all forms of malarial fever. Such highlands as those of *Namuli* form an exception to the general rule.

The delta of the Zambesi is extremely unhealthy, while the low, periodically flooded plains of Gasaland in the south possess a climate little better. Delagoa Bay, in the far south, presents a slight improvement, but its climate is far from healthy.

Madagascar :—

The South-East Trades, rising to get over the mountain axis, give the eastern slopes a heavy rainfall during the whole year, but this decreases on the western leeward shores. This rainfall is further increased on the northern half of the island in summer by the southern migration of the Equatorial Belt of Calms.

EXERCISES.

1. Show the effect of the migration of the sun's vertical rays on the climate of Africa south of the Congo.
2. Discuss the influence of surface upon the distribution of rainfall in South Africa.
3. How does the seasonal distribution of rainfall affect the rivers of South Africa and their consequent value to commerce?
4. Contrast the effect of Trade Winds on the African continent north and south of the equator.
5. Draw a sketch map of the Zambesi Basin, and indicate by shading the parts which are suitable for European occupation.
6. Name a mountainous island in the Trade Wind area. Describe its climate, and compare it with a similar island in the Western Storm Wind area.
7. Draw a map of South Africa and divide it into natural climatic regions. State the chief features of the climate of each region.

Flora.

Corresponding to the climatic divisions just enumerated we find similar vegetation regions.

The Mediterranean Region around Cape Town :—

The Mediterranean Region around Cape Town has the typical products of the Mediterranean type of climate, and *wine*, *wheat*, and *tobacco* are the chief cultivated products. Forests of *deciduous* and *evergreen trees* flourish, the chief timbers being *oaks*, *pinus*, and *Cape mahogany*. The introduction of *gum trees* from similar climatic regions in Australia has met with great success.

The whole area is rich in wild flowers, the *arum lily* being common. *Orchids* and *everlasting flowers* are noted, while *pelargoniums* are natives of the Cape.

The Coastal Plains of the East and South :—

These produce *maize*, *sugar*, and *tea*. The seaward slopes of the plateau are covered with tropical bush and forest, which include *palms*, but the dry climate of the Karroos only allows of the growth of grass, supporting *sheep*, *goats*, and *ostriches*.

Vegetation of all kinds is possible in Natal. *Bamboo*, *cotton*, *indigo*, *sugar-cane*, and *bananas* are grown on the coastal plain. *Tea* and *coffee* on the lower slopes are succeeded by *wheat*, *barley*, and *European*

fruits, while the upland valleys form pasture lands.

The *acacia* is the only tree grown on the arid Karroos. After a heavy fall of rain the whole aspect of these dry terraces is changed and *bulbous plants* spring everywhere into life.

The Plateau or Veldt :—

The Plateau or Veldt consists chiefly of pasture land suitable for *horses* and *sheep*. Its condition varies considerably with the

grown, while the *Lower Bush Veldt*, consisting of an outer strip of lower land, and extending to the valley of the Limpopo, can produce crops of *maize*, *tobacco*, *cotton*, *coffee*, and *sugar*. The border between Basutoland and the Orange Free State is capable of growing quantities of *wheat*, but the greater part of the latter state consists of poor grass land used for *stock-raising*.

Irrigation is necessary in every part of the plateau, where even the summer rains

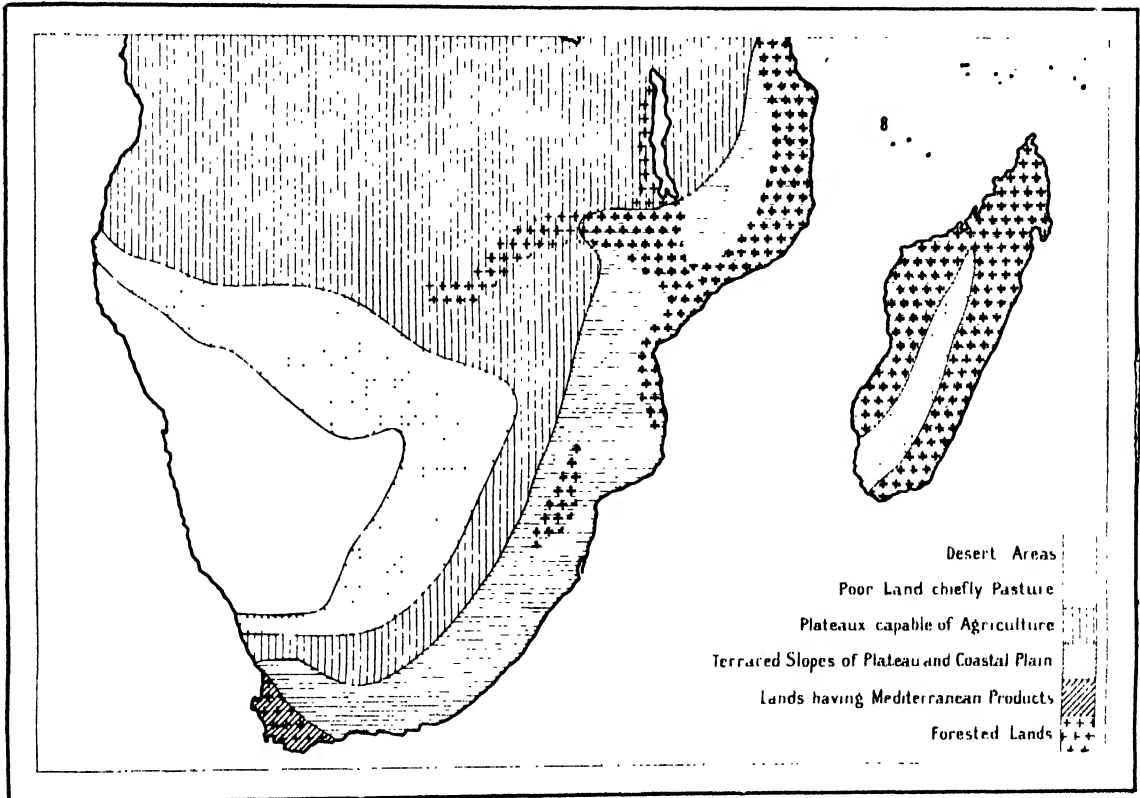


Fig. 15.—Vegetation Regions.

season, in the dry winter being almost bare, but with the first downfall of rain it is clothed with life. *Agriculture* is possible in the wetter eastern parts of the plateau, but towards the west the land is chiefly devoted to *stock-raising*. The Veldt is almost devoid of trees, especially is this so in the Orange Free State and in the *High Veldt* of the Transvaal, where, except for an occasional *acacia* or a *willow* growing along the river banks, trees are never seen. The High Veldt of the Transvaal is surrounded by the *Middle Veldt*, on which cereals, chiefly *maize*, are

are precarious. The soil is extremely fertile, and by an extension of these irrigation works could produce good crops of *wheat*, *barley*, *maize*, and *millet*.

The water-bearing rock beneath the soil of the plateau is responsible for the growth of numerous *bulbous plants* on the first approach of spring.

In 1896 the *rinderpest*, a deadly disease, swept over the whole of South Africa, and brought ruin to many Boer farmers by its wholesale slaughter of the cattle.

The *tsetse fly* inhabits the lower lands of the Bush Veldt and the river valleys. This

insect, no larger than a house fly, is harmless to human beings, but its bite proves fatal to both horses and cattle.

Swarms of *locusts* occasionally destroy all vegetation. Every sign of vegetable life disappears in their train, and these insects, devastating the land for miles, cause the animals to die of starvation. Sometimes a district may escape these plagues for years, and then suddenly is laid bare by their ravages.

The Kalahari and the West:—

The Kalahari and the West consist chiefly of sandy wastes, but areas of poor pasture support *cattle*, *sheep*, and *goats*.

The water is obtained from the impermeable volcanic rock which forms reservoirs below the surface, and those in the eastern half of the country are utilised by the Bechuanas to irrigate land, upon which they grow *maize* and *millet*.

Rhodesia:—

The greater part of this area of savannah land is covered with rich pastures capable of supporting large herds of *cattle*, but these have suffered in the past from rinderpest, and in the lower lands, from the ravages of the tsetse fly. By careful irrigation the whole country can be made highly productive.

Maize and *millet* are native to the soil, and *wheat*, *oats*, *cotton*, and *tobacco* are now being extensively grown, and will probably hold increased importance in the near future. In the northern half of the Zambesi Basin *coffee* thrives on the well-drained slopes, those of *Nyasa* producing the finest crops in the world. Here, also, *rubber* is a valuable product, obtained not only from the forests, which are specially protected, but also from plantations. The cultivation of *cotton* is also increasing, and *hemp* is grown everywhere.

The lower lands of the Upper and Middle Zambesi Basin, known as the *Barotse country*, are marshy and fever stricken, and infested by the tsetse fly and the mosquito. Hence this part of Rhodesia, especially in the wet season, is not favourable to white habitation, and at present produces little of commercial value.

Portuguese East Africa:—

Portuguese East Africa, being a low-lying country, for the most part is covered with

rank weeds, *coarse grasses*, and *mangrove swamps*, making permanent habitation impossible except on the ridges of higher ground. Quantities of *coffee*, *sugar*, *maize*, and *oil seeds* are grown, while the great rainfall on the plateau edges causes them to be covered with *dense forest*, producing quantities of *rubber*.

The low unhealthy coastal plain presents a striking contrast to the plateau which it borders, and may be compared with the low unhealthy Guinea Coast which borders the Niger Plateau.

Madagascar:—

Owing to the heavy rains which this island receives, it is encircled by a zone of dense woodlands. The eastern coastal plains with their damp climate produce quantities of *sugar*, *cotton*, and *pine-apples*. The eastern slopes are forested, and yield *ebony*, *teak*, *rosewood*, and other hard timbers, in addition to *rubber* and *gums*; while the lower damp but well-drained slopes produce *coffee* and *tea*. *Rice* and *maize* are the two chief crops of the lowlands.

The interior uplands, where the climate would allow of European settlement, are covered with barren, unproductive soil, yielding only a small herbage.

Fauna.

The earliest colonists in the Cape found the country inhabited by many wild animals, including the *lion*, *hippopotamus*, *rhinoceros*, *buffalo*, and *leopard*. The *antelope* family is also native to this region, and large herds of *hartbeests*, *elands*, *gnus*, and *quaggas*, in addition to *zebras*, *giraffes*, *hyænas*, *jackals*, and *baboons* abounded.

Owing to the extensive early destruction of game, and to white settlement, most of these animals have almost disappeared from the more southern areas. *Lions* are seldom seen, *hippopotami*, *rhinoceroses*, and *crocodiles* may be found in the low valleys of the Limpopo, the marshy districts of the Zambesi and the coast streams, and though the *elephant* still roams in Rhodesia, in southern areas he is only seen where special preserves have been set apart to prevent his extinction. *Panthers* and *leopards* may still be seen in the rough country, where they prey upon the domestic animals. The *gnu*, *eland*, *springbok*, *wildbeest*,

giraffe, and *zebra* are seldom met with in the lands south of the Transvaal, and are being largely replaced by domestic animals.

The Barotse country is a hunting ground noted for *lions*, *elephants*, *giraffes*, *rhinoceroses*, and other animals, while *waterbucks*, *antelopes*, and *springboks* form the game of the higher plateaux.

Baboons live in holes in the rocks, while *jackals* and *hyenas* inhabit the wild and more desolate parts.

Snakes, including the *puff adder* and the *cobra*, are very common, and their great enemy, the *secretary bird*, is carefully protected.

The lower lands of the Zambesi Basin form the home of numerous water-fowl, such as *pelicans*, *cranes*, *ibises*, *herons*, *geese*, and *ducks*.

The *monkeys*, *lions*, and *elephants* of the African continent are not found in Madagascar, thus proving that the island must have been severed from the mainland in early geological ages. The characteristic animal is the *lemur*, partly resembling the monkey and partly the rodents, while the *butterflies*, *beetles* and other insect life differ from those of other islands. *Crocodiles* infest the streams. Of the domestic animals the *one-humped ox*, which feeds on the coarse grass of the poor infertile lands, is important. *Bees* and *silk-worms*, the latter providing fibre for the natural weaving industries, are also plentiful.

Minerals.

The mineral wealth of South Africa greatly exceeds that of the vegetation, and accounts largely for the rapid development of this region during recent years. Rich supplies of *gold*, found in quartz and slate reefs, are obtainable from the Witwatersrand ridge, the Drakensbergs, and from the water-parting between the Limpopo and the Zambesi. The latter will probably, when fully developed, prove to be the richest gold area in the world. *Diamonds* are found at Kimberley in British Bechuanaland. *Coal* is mined in Natal, the Stormberg Range of the Cape of Good Hope Province, and in the Orange Free State and Transvaal, while rich supplies are found in the Wankie coalfields south of the Zambesi, as well as in Nyasaland. Plentiful *copper* supplies exist in the Kafue Basin, the Congo water-parting, and in Southern Rhodesia, while the valuable deposits found

in the drier lands of the west have caused railway development inland from Port Nolloth, and from the German port of Swakopmund. *Iron* is found in Nyasaland, where the natives mine and smelt it into spear heads, knives, and agricultural implements. Hartley Hill, in Southern Rhodesia, has rich supplies of this mineral, and valuable deposits are said to exist near the coalfields of Natal. The development of these in connection with the goldfields of the interior should be important.

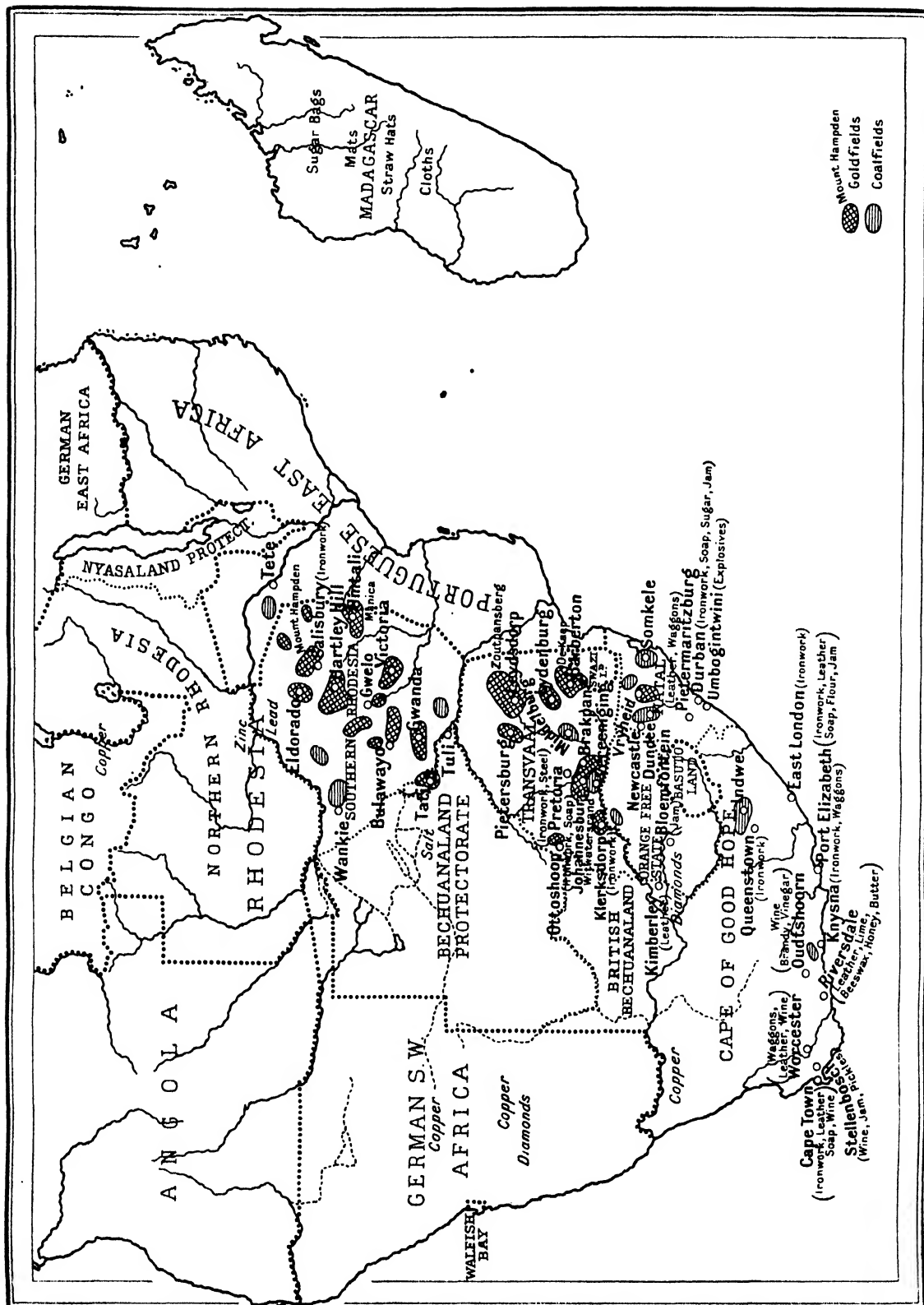
Gold:—

Gold, which is by far the most valuable mineral, was first worked in the De Kaap region of the Drakensbergs, with *Barberton* as its chief centre. The later discovery of rich deposits in the Rand (Witwatersrand) made the region the most important in the Transvaal. The Rand ridge is 60 miles long. The gold particles are more evenly distributed throughout the quartz than in any other gold-bearing district in the world, and this has made it profitable to use special machinery to crush the quartz and extract the gold. *Malmani* in the west, *Zoutpansberg* in the north-east, and *Pietersburg* in the north, are other rich gold-fields in the Transvaal. The gold which occurs in the *Matabele ridge*, stretching from Tati Hills to the Mashona Plateau, is everywhere apparent, and when fully developed will probably form the richest gold-field in the world. The output in this region increased from £80,000 in 1898 to £2,600,000 in 1912. The chief centre of this region is *Salisbury*. On the plateau edge are the gold-fields of *Manica*, with *Umtali* as the chief centre, while gold dust is found in the coast streams and exported from Portuguese East Africa. Similar alluvial gold, found in the northern tributaries of the Zambesi, suggests rich reefs on the Nyasa Plateau and in the Congo water-parting. Gold reefs also occur in Natal, and these are now being developed.

Diamonds:—

These are found in river diggings in the *Hopetown* district, and in the *Vaal Valley* as far as *Bloemhof*, near Pretoria, but the placer or dry diggings of *Kimberley* and *Jagersfontein* yield by far the largest amount. Here four natural shafts of

Map 23.



SOUTH AFRICA--MINERALS AND MANUFACTURES.

volcanoes are worked. These formerly rose above the ground as kopjes, but are now extinct, and the openings are known as pipes. The diamonds are discovered in the blue eruptive matter which fills the pipes, and the supply of precious stones is practically inexhaustible.

Coal:—

The rich supplies of Natal are found near *Dundee, Utrecht, Vryheid, and Newcastle*, and are now being sent over 200 miles to the coast for use on ocean liners. Coal is also found in the *Stormberg Range* where the railway from East London to Jagersfontein cuts through the plateau escarpment near *Indwe* and *Bethulie*, and also at *Kroonstadt* in the Orange Free State. The latter supplies are of poor quality, although they are used on the railways. In the Transvaal coal is obtained from *Johannesburg, Middelburg, Lydenburg, and Wakkerstroom*, but the most valuable supplies come from the *Wankie coalfields of Southern Rhodesia*, through which the main line of railway has been taken from Bulawayo to the Victoria Falls. This coal is said to equal in quality that of South Wales.

Copper:—

The valuable deposits in the dry regions of German South-West Africa and the Cape of Good Hope Province may cause a development of the interior of this region.

The rich *Katanga copper deposits* already referred to in Chapter II. are continued across the water-parting into the *Kafue Basin*, and in Southern Rhodesia rich supplies of iron and copper are mined near *Victoria*.

Iron:—

Iron is found with the coal in the *Transvaal*, and *copper, lead, silver, and zinc* are also known to exist in this province, but are not worked to any extent.

The mineral wealth of *Madagascar* consists of *iron, graphite, sulphur, copper, gold, and galena* (lead). *Gold*, sometimes in the form of *nuggets*, but obtained mostly from *river alluvium*, is widely diffused, and probably with greater development could be produced in large quantities. In the north of the island there are rich seams of coal.

Manufactures.

Despite the large European population in South Africa, and the encouragement given to local manufactures by protective tariffs on imported goods, yet, owing to lack of fuel, and still more to the scarcity of unskilled labour, manufactures are at present quite unimportant.

Around Cape Town the growth of the *wine* is responsible for the manufacture of a considerable quantity of *wine*, but this is of inferior quality owing to the large proportion of sugar contained in the locally grown grape. Other industrial works include *flour-mills, breweries, tobacco factories, tanneries, saw-mills*, and *coach-building works* in the Cape of Good Hope Province and the Transvaal. In Natal *starch factories*, dependent upon the growth of potatoes, and *beet sugar* industries are being established. Elsewhere the whole energies of the people seem to be concentrated on the development of the rich mineral wealth, or on agricultural and pastoral occupations.

The natives of Madagascar are very clever hand weavers, and export *articles made from silk, cotton, hemp, and vegetable fibres*. The latter are woven into *mats* of beautiful designs, while *mat bags* are used for packing the sugar, and fine *straw hats* are the usual head covering of the native peoples. The natives also are skilful in the working of metals, particularly that of the locally obtained iron.

EXERCISES.

1. Divide South Africa into vegetation regions, and show how these are determined by climatic conditions.
2. Name the chief regions of the world possessing a Mediterranean type of climate, and compare the vegetation of each.
3. Describe the productions of the south-east coastal plains and terraced escarpments. Show to what extent they are dependent upon elevation and climate.
4. Name the chief difficulties with which the pastoral and agricultural farmers of the plateau have to contend.
5. Describe the vegetation of the plateau, and compare its distribution with that of the rainfall.
6. Describe the natural vegetation of Rho-

desia, and show the capabilities of the country. Name the chief crops which are produced.

7. Compare the climate and vegetation of Portuguese East Africa with that of the Guinea coastal plain.
8. Describe the vegetation of Madagascar, and show how far it is dependent upon surface and climate.
9. Describe the South African fauna. Explain how the animals of Madagascar differ from those of the true African continent.
10. Draw a map of South Africa showing the position of the chief gold and coal fields and other sources of mineral wealth. Insert the chief mining towns.
11. Name the chief manufactures carried on in South Africa. Explain why they are not likely to increase to any great extent.

Routes.

The main line of railway, which runs in a north-easterly direction from Cape Town through *Fryburg* and *Mafeking* to *Bulawayo*, divides South Africa roughly into two areas—a peopled eastern half, and an undeveloped western portion. So long as South Africa depended upon its agricultural and pastoral occupations the climatic conditions confined the people to the east of this line. The discovery of minerals in the latter half of the nineteenth century led to a rapid development of the railways inland to tap these mineral resources. Under the heading of Coast we have noted that the coast-line is for the greater part inhospitable, and only at a few points are harbours possible. Hence the railways are carried inland from these ports by steep gradients to the plateau escarpment. The mountainous nature of much of the border will not allow of a continuous line of railway linking up these important ports. The trade, therefore, from port to port is largely of a shipping nature. In the west the recent development of copper has led to railways being carried inland.

It has already been seen that the intermittent rivers, instead of being an aid to commerce, are an obstacle to movement, and therefore form political boundaries rather than routes into the interior. Except the Zambesi, which is navigable to *Tete* at the foot of the Kebra Basa Rapids and to *Chiromo* and *Port Herald* on the Shire

River, there are no water communications, unless we include the small river craft which navigate parts of the Upper Zambesi and the tributaries draining Northern Rhodesia.

The carrying of railways inland from four or five places on the coast still leaves large areas not connected by rail. Roads are bad, and passengers by the mule-drawn coaches have a very uncomfortable journey. The usual method of conveyance from one district to another is the ox-waggon, a low house on wheels drawn by a team of sixteen or eighteen oxen. This, although much more comfortable, is very slow, 12 to 16 miles being a good day's journey, while the scarcity of water, especially in such dry areas as Bechuanaland, proves a great drawback.

Railways:—

Place Blank Surface Map 5 under the Transparent Route Map, and trace the following lines of railway from the chief seaports:—

From *Cape Town*, through *Paarl* and *Worcester*, to *Beaufort* on the Great Karroo, then continued on the veldt through *De Aar* to the diamond centre of *Kimberley*, and from thence through the borderland of the Transvaal and Bechuanaland, *via Fryburg* and *Mafeking*, to *Bulawayo*. From the latter the main line turns north-westward *via* the *Wankie* coalfields to the *Victoria Falls*, below which the railway crosses the river, and then *via Kalomo* and *Broken Hill*, crossing the *Kafue River* to the *Star of the Congo* in the *Katanga* district of the *Southern Congo Basin*.

A second main line roughly parallel with the first starts from *Port Elizabeth*, and is carried inland through *Bloemfontein* to the goldfields of *Johannesburg*, and continued farther north to those of *Pietersburg*.

A third main line starts from *Durban*, ascends the plateau by very steep gradients, and is continued onwards to *Johannesburg* and *Pretoria*, with an important branch from *Ladysmith* to the Orange Free State.

From *Lorenzo Marquez*, the Portuguese port on *Delagoa Bay*, another line is carried inland to the goldfields of *Johannesburg*. From the Portuguese port of *Beira* trace the route which follows the Pungwe Valley to *Umtali*, and from thence to *Salisbury*,

the chief gold-mining centre and capital of Rhodesia. This latter town is also connected with the main line from Cape Town *via* *Charter* and *Gwelo* to *Bulawayo*.

In addition to these trunk lines there are other cross lines linking them together. Trace on the map the following routes:—

A line from *East London*, which crosses the *Stormberg Range*, sending a branch to the coalfields at *Indwe* and joining the trunk line from *Port Elizabeth* at *Springfontein*. It is proposed to continue this railway to *Kimberley*.

Cross lines join *Stormberg* to *Rosmead Junction*, from which a line is continued through *Colesberg* to join the Cape route at *De Aar*.

Another line joins *Port Elizabeth* to *Aliwal South* on Mossel Bay, and this is continued to join the Cape main route at *Worcester*.

Along the west coast find *Port Nolloth*, *Angra Pequena*, and *Swakopmund*, and trace the lines inland from these ports.

From *Port Nolloth* a railway has been carried inland to *Ookiep* and *Springbok*.

From *Angra Pequena* the route leads inland *via* *Bethany* to *Ketmanshoop* and *Warmbad*.

From *Swakopmund* two lines run inland, one to the copper-mining centres of *Otavi* and *Grootfontein*, the other to *Windhoek*, the German capital of this state.

The railway from *Port Herald* on the navigable lower portion of the Shire River is constructed to *Blantyre*, and when this is continued northward to the navigable Lake Nyasa through communication will be possible to the Plateau of the Great Lakes, and even to the Upper Nile Basin.

Mention has already been made of the navigation by river steamers of the Lower Zambesi and Shire Rivers. Trace the route from *Port Herald* to *Blantyre*.

Lake Nyasa is navigated by several steamers, while between this lake and that of Tanganyika is the *Stevenson Road*. A glance at the map will show that this forms a link in a natural road to the interior, which will in future form an important commercial highway.

Since the French occupation of Madagascar excellent waggon roads have been

constructed between the principal towns, while a railway taking a zigzag course from *Tamatave* climbs to *Antananarivo*, the capital.

Much of the produce of the island is still, however, carried to the coast by human porters. The French Government have a regular transport service on the lower courses of the rivers, and the natives, who are skilful in the use of their canoes, get much farther up the streams.

Commerce, Seaports, Trade Centres.

The surface features of South Africa, consisting of steep escarpments to the south and east coasts, and the desert nature of the western shore, are obstacles which have hindered trade with other countries, but these have now been surmounted by railway communications. The rapid development of mineral wealth during the latter half of the nineteenth and present centuries, together with a more united and settled form of government, should cause an enormous increase of trade within the near future. The large population attracted to the diamond and goldfields should also have its effect on the vegetation by creating larger local markets for the agricultural produce, thus making it profitable to construct irrigation works to further develop agricultural resources.

Rhodesia possesses great mineral wealth and immense agricultural and pastoral possibilities. This land could not only provide a suitable home for emigrants from the British Isles, but in the near future may supply the markets of Britain and Europe with valuable food supplies and raw material.

At present German South-West Africa and the north-west of the Cape of Good Hope are not productive, and with the exception of copper have little to export.

The scarcity of good harbours causes nearly all the export trade of the interior to be confined to the British harbours of *Cape Town*, *Port Elizabeth*, and *Durban*, and the Portuguese ports of *Lorenzo Marques* and *Beira*.

Cape of Good Hope Province:—

Here, as in many other parts of South Africa, the pastoral industry is the most important. *Cattle* and *merino sheep* (the

latter introduced at the beginning of the nineteenth century) provide a large proportion of the exports, consisting of *wool*, *hides* (oxen), *skins* (sheep and goats), and *hair*. On the dry Karroos the rearing of *ostriches* has created a large output of *feathers*. Agriculture is carried on in the wetter regions of the east, where *maize* forms the chief product, and in the district of Cape Town Mediterranean products are grown. Hence there are exports of *wheat*, *oats*, *barley*, *Kafir corn*, and *wine*. Extensive irrigation works in the Breede and Fish river-valleys and in the Colesberg district south of the Orange have been constructed, which should increase the agricultural products.

Both these agricultural and pastoral products are, however, unimportant as compared in value with the *diamonds* of Griqualand. These have been actively worked at Kimberley since 1869, and are now controlled by companies, who regulate both the methods and rate of production. *Copper*, obtained from Port Nolloth, is an increasing product.

The chief seaports are *Cape Town* and *Port Elizabeth*, while *Port Alfred*, *East London*, and *Aliwal South* are of secondary importance. Inland the chief towns are mostly at the junction of railway routes as *De Aar*, or mining centres, e.g., *Kimberley*.

Cape Town, situated on Table Bay and backed by the flat-topped Table Mountain, holds a position in the far south-west of the continent on the route taken by steamers to India and Australia, which is of extreme importance to a seapower like Britain. Its harbour, protected by a breakwater from the fierce westerly gales, has become a very important coaling station. The main line of railway, which reaches inland to the Congo Basin, causes it to export not only the produce of the province itself but also that of the Orange Free State, Transvaal, and Rhodesia. Its population is larger than that of any other South African town. *Simonstown*, on Simon's Bay, is the chief naval station of South Africa.

Port Elizabeth, in the east of the state, is the outlet of the agricultural and pastoral exports of the richer eastern half of the plateau. Situated on an open roadstead, it once consisted of sandy wastes, but since water has been brought a fine

town has been built. Its chief exports are *wool*, *ostrich feathers*, *hides*, and *diamonds*.

Port Alfred and *East London* lie to the east of Port Elizabeth, while *Aliwal South* is on Mossel Bay, midway between Cape Town and Port Elizabeth.

Kimberley is by far the largest inland town, and owes its importance to the diamond fields. Once a poor mining camp, it is now a well built town with good drainage and an abundant supply of water.

Graaf Reinet is one of the most important pastoral centres of the Eastern Karroo, and *Grahamstown*, connected by railway with Port Elizabeth and East London, is the centre of an ostrich-farming district.

De Aar, at the junction of lines from the Cape and Port Elizabeth, *Paarl*, *Worcester*, *Beaufort West*, *Mafeking*, and *Vryburg* are route towns on the main line of railway inland from Cape Town.

Natal:

The coastal plains produce *sugar*, *tea*, *maize*, and *wattle bark* for export. *Cotton* plantations, recently introduced, promise an important export in the future, while *fruits* are now sent out. The large *coal* deposits extending from Elandslaagte to Newcastle, and others in the Vryheid and Utrecht districts, provide a large export of this mineral, which is used for shipping. The development of *gold*, known to exist, may also increase the exports.

In addition to these local products, a large proportion of the produce of the Transvaal and the Orange Free State finds an outlet through the port of Durban.

Durban, on the inlet of Port Natal, is the chief port. Since the mineral development of this state and that of the Transvaal its trade has increased largely.

Pietermaritzburg, the capital, with a population of over 30,000, has a healthy situation on a plain 2000 feet above the sea, well watered by rivers and surrounded by wooded hills.

Ladysmith, on the plateau escarpment, is a junction where one line branches to the Transvaal and another to the Orange Free State.

Orange Free State:

The chief occupation in this country is *stock-raising*, but a rapidly increasing quantity of *grain* is being grown. Experimental

farms have been established with a view to encouraging agriculture, and a Land Board is engaged in facilitating the settlement of immigrants. The chief animal exports are *wool, mohair, hides, skins, eggs, and butter*, while *wheat, mealies* and *Kafir corn* are the chief grain products. *Diamonds*, found at Jagersfontein, provide the largest mineral export, but *coal* is also obtained. This state, possessing no sea-board, carries its export material to the ports of Natal or the Cape Province. There are no large centres of population, the towns being chiefly market centres at the convergence of routes.

Bloemfontein, the capital, has a population of over 25,000, and is the only town of any size.

Harrismith, guarding a pass over the Drakensbergs, is an important railway centre. *Smithfield* and *Ladybrand* are agricultural centres in the Caledon Valley, and *Bethulie* is situated near the confluence of the Orange and Caledon.

Transvaal:—

The chief export of this country is the *gold* obtained from the Rand and other gold-fields. *Coal* forms a largely increasing product, and the output of *diamonds* obtained from the Vaal Valley is increasing. Large tracts of the country are only suitable for *stock-raising*, although there are considerable areas well adapted for agriculture. *Wheat, maize, tobacco, coffee, and sugar* are cultivated. This country carries on its external trade through the ports of Lorenzo Marquez (Portuguese East Africa), Durban (Natal), and Port Elizabeth and Cape Town, to which it is joined by rail. The towns fall into two distinct groups, large mining centres chiefly occupied by British, and small farming centres where the Boer farmers meet to transact business.

Johannesburg, with a population of 250,000, is the largest town, and from it four railway routes radiate to the ports on the coast, while a fifth is connected with the more northern Pietersburg coalfield. Situated on the Witwatersrand ridge, 6000 feet above the sea, it has a healthy situation, and since the rapid mineral development a handsome modern town has been erected.

Barberton, Lydenburg, and Pietersburg are other important gold-mining centres with rapidly increasing populations, while

Middelburg and Heidelberg are near the coal-mining areas.

Pretoria, the capital, with a population of 48,000, is the largest of the agricultural towns, and contains the official residence of the Governor-General of the Union.

Potchefstroom, on the Orange Free State border, was formerly the seat of government, and rivalled Pretoria in importance.

The Bechuanaland Protectorate and German South-West Africa:—

These, consisting chiefly of desert lands, are of little commercial importance. *Copper* deposits in the latter have caused a development within recent years, while *diamonds* are also obtained. The cultivation of *cotton, silk, and tobacco* is being tried in some of the more favourable areas of the German province.

The chief harbour along this coast is *Walvisch Bay*, a British possession, but near to it the Germans have built an artificial harbour at *Swakopmund*, while farther south is the port of *Angra Pequena*, from which a railway runs inland.

Rhodesia and British Nyasaland:—

The commerce of Southern Rhodesia has grown largely within recent years, and with increased railway facilities and agricultural development will shortly show a further progress. At present large parts of Northern Rhodesia are awaiting development, but should in the future provide food and raw material to the civilised world. At present the rich mineral deposits form the greater part of the exports. The *gold* output alone reaches £20,000,000 annually, while the export of *coal, silver, iron, copper, lead*, and other minerals is considerable. Apart from this, the agricultural and pastoral occupations supply a large export. *Butter*, in addition to *meat* and other *animal products*, is obtained from the grass lands of Southern Rhodesia. *Cotton, tobacco, hemp, rice, sugar, maize, and wheat* are grown in both the Northern and Southern provinces, while *rubber* is obtained from the forests of Northern Rhodesia, and also from plantations. *Tea and coffee*, the latter of excellent quality, form important products of Nyasaland. The products of this region find an outlet either through the Portuguese port of Beira or by the navigation of the Lower Shire and

Zambesi Rivers. The railway from Port Herald to Blantyre facilitates the export of goods from the interior of Nyasaland.

In *Southern Rhodesia* the two chief towns are *Bulawayo* and *Salisbury*, situated at either end of the Matabele Plateau. *Tuli*, *Victoria*, *Charter*, *Gwelo*, *Hartley*, and *Umtali* are on the railway, and are engaged chiefly in mining operations.

Bulawayo is 1360 miles from Cape Town and three and a half days' railway journey from it. Broad streets, good houses and hotels give one the impression of a modern European town.

Salisbury is separated by only 370 miles from Beira and only 200 miles from Tete, the limit of navigation on the Zambesi.

On the railway from Bulawayo to Victoria Falls many new towns are springing up, especially on the rich Wankie coalfields.

The chief towns of *Northern Rhodesia* are *Livingstone*, the capital, *Kalomo*, on the railway, *Fort Jameson*, the capital of North-East Rhodesia, and *Piše* and *Abercorn*, on the Stevenson Road.

The chief towns of *British Nyasaland* are *Port Herald* and *Chiromo* on the lower navigable Shire River, *Blantyre* on the higher land, *Bandawe* the centre of a rich coffee-producing district, *Fort Johnston* on Lake Nyasa, and *Zomba* the capital.

Portuguese East Africa:—

Apart from the through traffic which reaches the coast either through the Zambesi or the railways to the ports of Beira and Lorenzo Marquez from Rhodesia and the Transvaal, this large coastal province is quite unimportant. The unhealthy climate and the bad government of the country are the two chief factors which have retarded development. Important ports such as *Zumbo* on the Zambesi, *Quilimaine*, and *Sofala* have fallen into decay since the slave trade has been abolished. The largest export of this area is *rubber*, but *sugar*, *cocoa-nuts*, and *bees-wax* are also sent out, while *gold-bearing reefs* and extensive *coal deposits* might, if properly developed, provide a much larger output.

Lorenzo Marquez, on Delagoa Bay, is the coast terminus of a railway inland to the Transvaal, while *Beira*, at the mouth of the river Pungwe, is the terminus of another line inland to Southern Rhodesia.

Mozambique is the chief port for the local products, and *Inhamitanga* is chiefly engaged in exporting the rubber of the interior.

Madagascar:—

The occupations of cattle breeding and agriculture provide exports of *hides*, *cattle*, *rice*, *sugar*, *coffee*, *cotton*, *vanilla*, *tobacco*, and *cloves*. The forests yield valuable *timber* in addition to *caoutchouc*, *gums*, *resins*, *bark* for tanning, and *medicinal products*. *Gold* from the mines now forms an important article of export.

Antananarivo, the capital, the only inland town of any importance, is situated on a long rocky ridge bordering the edge of an extensive rice plain, and well watered by rivers.

Diego Suarez in the north, *Tamatave* in the east, and *Majunga* in the north-west, are the chief ports.

EXERCISES.

1. Show how the distribution of railways has been determined by the sources of the mineral wealth.
2. Explain why the railways of South Africa are confined chiefly to the eastern half of the continent, and why they start from five points on the coast.
3. Name the chief river communications of South Africa. Explain why the rivers of this region form for the most part an obstacle rather than an aid to movement.
4. Draw a map of the chief routes leading to Rhodesia.
5. Through what ports do most of the products of the inland provinces of the Orange Free State and the Transvaal find an outlet? Name the chief routes by which these products are taken.
6. Show how natural features will determine a route inland to the Equatorial Plateau and continued northward to the Nile and Mediterranean.
7. Show how the communications and commerce of Madagascar have improved since the French occupation.
8. Describe the position of five of the chief seaports of South Africa and the routes leading to them. State the chief products which find an outlet through each.
9. State why the control of routes was the main object of the opposing forces in the South African War. How did the neutrality of Portugal render the routes

to Durban and Cape Town of greater importance?

Distribution of Population.

By comparing fig. 16 with fig. 15 showing the distribution of vegetation, it will be seen how the distribution of the latter has determined that of the former. The fertile coastal plains, especially those behind Durban, Port Elizabeth, and Cape Town, support the

at Kimberley, the coalfields of Natal, and the copper deposits of German South-West Africa provide areas of relatively denser population as indicated by the shading in the diagram.

The rich coalfields of Rhodesia are responsible for a more thickly peopled district on the Matabele Plateau, but the whole population of this region is rapidly increasing on account also of the rich vegetable resources.

The well-watered island of Madagascar

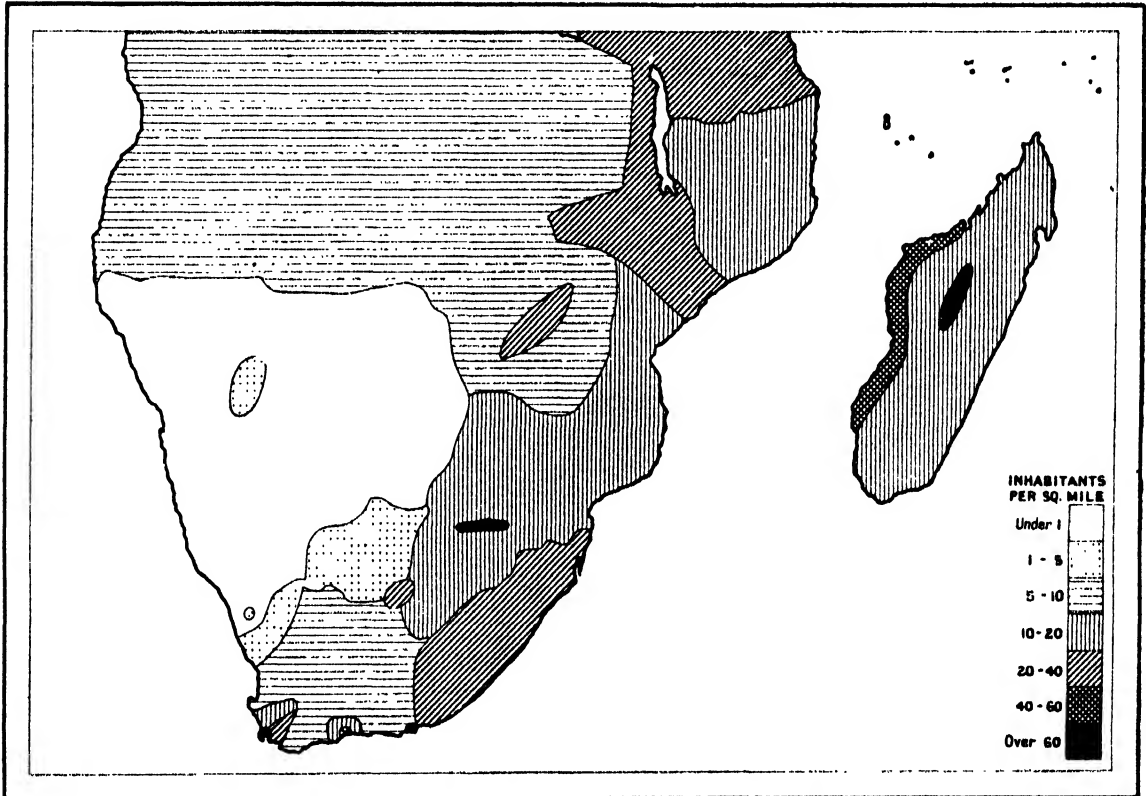


Fig. 16. --Density of Population.

densest population, and this decreases gradually as we pass through the agricultural lands of the Eastern Plateau to the drier grass lands of the interior, while the arid regions of the west are the most sparsely peopled. Similarly, the lowlands round the navigable Shire and Zambesi Rivers support a denser population than does the interior plateau.

The above comparison is modified considerably by the distribution of mineral wealth. The goldfields of the Transvaal are responsible for the immigration during recent years of a dense population. The diamonds

supports a very dense population, especially along the lower accessible coast lands of the west and on the healthier plateau in the neighbourhood of Antananarivo.

Native Peoples.

The original inhabitants of South Africa were *Bushmen*, a stunted, yellow-brown, degraded race of people, who exhibit few traces of civilisation, unless we except the paintings found upon the walls of their caves. Such mural 'decorations'

have been found as far north as Tanganyika, and suggest that at one time these people occupied the southern half of the continent.

These aborigines were succeeded by the pastoral *Hottentots*, with yellow-brown faces, flat noses, thick lips, woolly hair, and very dull intellects. The original European settlers found these people living in circular villages or kraals, consisting of low bee-shaped huts made by weaving grass and branches. Their language is distinguishable by a peculiar clicking sound difficult for the European to imitate. The movement of the white settlers inland from the south and east coasts, and more especially the pushing of the more powerful Bantu races from the northern and eastern plateaux, drove these people to the desert regions of the west, where with the Bushmen they find a scanty pasturage for their flocks and herds. A few *Hottentots*, however, are still found in the districts near Cape Town, while the inhabitants of Griqualand are largely mongrel *Hottentots* who have intermarried with the Dutch settlers.

These races of people form an almost negligible factor in the peoples of Africa to-day, but the *Bantu* races living on the healthier plateaux of the north and along the east coasts are an important item in the present population, and in the past have exerted a large influence on the development of the country. These people, known in South Africa as *Kafirs*, include the physically strong races of the *Zulus*, *Matabeles*, *Basutos*, *Bechuanas*, *Swazis*, and *Pondjes*, and have attained a higher intellectual level than have the *Hottentots*.

The *Bechuanas*, living in great tribes ruled over by powerful chiefs, are a pastoral people occupying the strip of land known as the Bechuanaland Protectorate, and lying between the desert and the Boer states of the Transvaal and the Orange Free State.

The *Bechuanas* are closely related to the *Basutos*, who occupy South African Switzerland, a mountainous land between the upper courses of the Orange and Caledon. This land, set aside by the British Government for their use, is highly cultivated, and here the *Basutos* now lead a peaceful agricultural life.

The most powerful of all the South African races are the *Zulus*, whose true home lies between the east coast and the

plateau escarpment. These people organised a well-disciplined army, and occupied the whole plateau. Their regiments or "impis," consisting of fierce, brave warriors, conquered all the native tribes with whom they came in contact, and proved most stubborn enemies when met by British forces. A branch of this race forms the Matabele *Zulus*, who, spreading across the Transvaal, drove the more peaceful *Mashonas* northward, and constantly raided them for fresh supplies of food. Another branch of this same race settled north of the *Zambesi* in the lands of North-Eastern Rhodesia.

In North-West Rhodesia reside the powerful *Barotse* peoples, closely related to the *Bechuanas* and the *Basutos*. The most important people of Nyasaland are the *Yao*, invaders from the east, who with Arab assistance would have conquered all the state had it not been for British interference.

The unskilled labour so necessary in a newly-developed state is performed largely in South Africa by the Bantu peoples. These *Kafirs*, though strong and willing to work periodically, are unfortunately wanting in application, and will only come to the European settlements for a time long enough to allow of earning sufficient money to support them in idleness among their own people.

In the Cape of Good Hope Province and Natal there are a number of *Indian coolies*, imported in early days to meet the demand for unskilled labour. This immigration is decreasing, but the coolies having finished the contract for which they were engaged do not return to their native land, but become small retail traders competing with their European rivals.

In Portuguese East Africa the natives belong chiefly to the *Bantu* races, but are degraded by the unhealthy conditions of the plain and by past contact with the slave traders.

Madagascar differs from the true African continent in that it contains numbers of *Malay* peoples related to those of the East India Islands. The *Hovas*, with their lank hair and lighter complexions, are of almost pure Malay descent. They live chiefly on the more populous areas of the central plateau, and their language and customs predominate over those of the early Bantu inhabitants and the more recently introduced slaves from the mainland. On

the west, and more largely on the eastern lowlands, are mixed races of Malay and African blood.

History.

The first European explorations of this region took place in the latter half of the fifteenth century, when Bartholomew Diaz rounded the Cape. This was followed by the founding of numerous Portuguese ports along the coast, not with the object of internal development, but as stations *en route* to their important Indian possessions. These journeys to a great extent followed the coast-line, hence most of these stations, such as Delagoa Bay, are out of the direct track of the main steamship lines.

Two centuries later the Dutch settled at Cape Town, and the revocation of the Edict of Nantes in 1685 caused a large influx of French Huguenots, who, intermarrying with the Dutch, formed a mixed race of people, now known as Boers or Afrikanders. These settlers pushed into the interior, and finding the Karroos too dry for agriculture they became mainly a pastoral race.

Later, Britain annexed Cape Town, and British immigrants also spread inland from Port Elizabeth. Political friction arose between these and the Afrikanders. Many of the latter travelled northwards into the High Veldt between the Vaal and the Orange, where they formed the Orange Free State. Others trekked to the eastern coastal plain, but met with considerable opposition from the native Zulus and from the British traders of Durban, who appealed to the Home Government for help. The Boers, therefore, moved north of the Vaal, and founded the Transvaal Republic.

The founding of these new states on the plateau caused the pastoral Hottentots and Bushmen to move towards the desert and the Bechuanas to occupy the lands bordering the eastern side of it.

Early in the nineteenth century Zulu tribes from the south invaded Rhodesia and raided the Mashonas. These latter, a peaceful race, practised agriculture and worked the mineral resources of the country, but the Matabele Zulus drove them to the valleys of the north-east. Constant raids by these Matabele, not only on the peaceful Mashonas but also on the Boers of the Transvaal, led

to British intervention, which resulted in the defeat of the Matabele under Lobengula. Since then the whole administration of law and order in Matabeleland and Mashonaland has been placed under the control of the British Chartered Company of South Africa. To prevent a native war in this region the British also peacefully annexed the Transvaal, but this led to considerable opposition from the freedom-loving Boers, who, at Majuba Hill in 1881, defeated the small British force sent against them, and caused the British Government to relinquish the control of this state, only exerting a suzerainty over it.

The discovery of diamonds at Kimberley and in the Orange Free State, and the rich resources of gold in the Transvaal caused the introduction of a large European mining population, chiefly composed of British, and continuous conflict between these and the agricultural and pastoral Boers led to the South African War in 1899. Since the termination of this war the Cape of Good Hope Province, Natal, the Orange Free State, and the Transvaal have been merged into one under the title of the "Union of South Africa" (see Political Divisions).

German South-West Africa was proclaimed a German possession in 1884, except the harbour of Walvisch Bay, which remained British. Despite all attempts at colonisation by the Germans the country remains a desert land, and a rising of the Hottentots in 1904 delayed attempts at progress.

In 1895 the native state of Barotseland, known as North-Western Rhodesia, and the more eastern state of North-Eastern Rhodesia were handed over to the administration of the British Chartered Company, while in 1911 these two states were merged into one under the title of Northern Rhodesia.

The Arab and Yao invaders who overran British Nyasaland have now been defeated by the British, and since the exercise of direct control by the Home Government many British (chiefly Scots) have settled down, and are gradually exerting a civilising influence over even the Yao invaders themselves.

The journeys of Vasco da Gama and other Portuguese explorers caused settlements to be formed along the whole of the eastern coast, mostly on the sites of the

Arab trading stations, but with the fall of the Portuguese Empire in the Indies the Arabs regained those north of Cape Delgado, leaving to the Portuguese only the long coastal strip between German East Africa and Zululand. Most of this area is controlled by native chiefs, but a large number of half-breeds carried on a slave trade, and its suppression is responsible for the decay of many of the Portuguese ports.

Portuguese navigators discovered the island of Madagascar at the close of the fifteenth century. Colonies were afterwards founded by the Portuguese, Dutch, English, and French. Ultimately, however, the last gained control of the whole island by a protectorate obtained in 1835, while a war later, in 1895, gave them full sovereignty. Since French occupation the trade and resources of the island have been developed.

Political Divisions.

Under the title "Union of South Africa" in 1911 the *Cape of Good Hope Province*, *Natal*, the *Orange Free State*, and the *Transvaal* became united in one Legislative Union with an elected central Parliament meeting at *Cape Town*, and a Governor-General appointed by the Crown, having his official residence at *Pretoria*. This parliament makes laws and controls the taxation and customs' duties, while provincial Parliaments in each state, under a Commissioner appointed by the Crown, manage local affairs. The defence forces of the Union have recently been increased and reorganised.

The *Province of the Cape of Good Hope* consists of the Colony proper and the native states of East Griqualand, Tembuland, Pondoland, the Transkei territories, and British Bechuanaland. The whole occupies an area greater than twice that of the British Isles.

The Cape Peninsula is fortified, and men-of-war are based on Simonstown. The land force consists of Cape Mounted Riflemen and Mounted Police, but every able-bodied man is subject to military service.

The 400 square miles of British territory behind Walfish Bay on the German South-West African coast lies midway between the Orange and Kunene Rivers. The port is situated at the mouths of

two rivers, which although unimportant enable routes to be carried into the interior.

Natal, occupying the coastal plain and the plateau escarpment, has an area larger than that of Ireland, with a seaboard of 360 miles. The province of *Zululand* was placed under this government in 1897, and the districts of *Vryheid*, *Utrecht*, and part of *Wakkerstroom* were transferred from the Transvaal in 1903. *Pietermaritzburg* is the seat of the local government.

The *Transvaal* lies between the Vaal and Southern Rhodesia, and has an area almost equal to that of the British Isles. Its capital is *Pretoria*.

The *Orange Free State* lies between the Orange and the Vaal, and has an area equal to that of England. Its capital is *Bloemfontein*.

The *Bechuanaland Protectorate* comprises all that territory between the Molopo tributary on the border of British Bechuanaland to the Zambesi on the north, extending from the Transvaal and Rhodesia on the east to German South-West Africa on the west. Its population, consisting largely of natives, is ruled over by native chiefs under the protection of the King, who is represented by a Resident Commissioner.

Basutoland occupies a rugged plateau between the Orange Free State, Natal, and the Cape of Good Hope Province. It is essentially a native territory, controlled by native chiefs, who are under the protection of the King, represented by a Resident Commissioner.

Swaziland, a native state in the south-east corner of the Transvaal, once formed part of that province, but was removed from its control in 1903. A resident official, acting under the High Commissioner of South Africa, represents the British Government, which has now direct control of the territory.

German South-West Africa:—

This state includes the region lying between Portuguese Angola on the north and Cape Colony on the south, and extends eastward to the British Bechuanaland Protectorate, but excludes the port of Walfish Bay already mentioned.

For purposes of administration it is divided into Damara and Namaqua land. The seat of government is at *Windhoek*.

Rhodesia :—

This now comprises the areas of Matabeleland and Mashonaland south of the Zambesi, the Barotse country, and North-Eastern Rhodesia, extending from Portuguese Angola in the west, to Nyasaland and Portuguese East Africa. The whole area forms a protectorate under the control of the British South African Company, which was granted a charter in 1889. It is named after its first managing director (Cecil J. Rhodes). The Zambesi divides it into two provinces, known for purposes of administration as Northern and Southern Rhodesia.

In *Southern Rhodesia* registered voters elect representatives on the Legislative Council, while a Resident Commissioner, appointed by the Home Government, represents the Crown. The seat of government is at *Salisbury*.

Cecil J. Rhodes lies buried in the granite Motopopo Hills, in the centre of the region he did so much to develop.

Northern Rhodesia is divided for purposes of government into ten magisterial districts, with the administrative headquarters at *Livingstone*.

British Nyasaland :—

This state, having an area one and a half times that of Scotland, borders the southern and western shores of Lake Nyasa, and extends southward to the Zambesi.

It is administered by the Colonial Office in London, which appoints a Governor and Commander-in-Chief, who is assisted by a Council of nominated members. The seat of government is at *Zumbo*.

Portuguese East Africa :—

This state lies between German East Africa and Zululand. Parts of it are controlled directly by the state, while others are under the administration of the Mozambique and Nyasa Companies.

The Mozambique Company controls all the land inland from *Sofala* to the goldfields of *Manica*, and is also responsible for

the settled conditions and convenient transport in the Lower Zambesi. The Nyasa Company administers the region between Lake Nyasa and *Lurio*. The Portuguese have very little hold on their own states, native chiefs control the unhealthy coastal plain, and Portuguese half castes are responsible for much of the bad administration in those areas not controlled by the Companies.

Madagascar :—

This colony, directly controlled by the French Government, is partly under civil and partly under military control, with a Resident Governor-General appointed by the Government at the head of affairs.

This island, larger than France, has a population of over 3,000,000 people, of which more than three-quarters are natives.

EXERCISES.

1. Show how the distribution of population has been determined by that of (a) vegetation, and (b) mineral wealth.
2. Name the chief native races inhabiting the Zambesi Basin, and state the chief events which preceded the handing over of this area to the British South African Company. Show the development subsequent to its formation.
3. Name the chief Bantu races in South Africa. Indicate on a sketch map the localities where each are found.
4. Name the chief characteristics of the Hottentots and Bushmen. Show how the increase of European settlement has driven them towards the desert.
5. Show how the discovery of mineral wealth has altered the whole importance of this region.
6. Briefly narrate the chief events which led to the South African War.
7. What provinces are included under the Union of South Africa? State how these are now governed.
8. Name the chief native states of South Africa. How are these controlled?
9. Describe the history and government of Portuguese East Africa.



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